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Avifauna of Boni-Dodori National Reserves, Lamu and Garissa Counties, Kenya

Tobias Otieno, Timothy Mwinami, Martha Ngala, Sandy Oduor, Fleur Ng'weno, Simon Musila and Charles Kimwele

Summary

A comprehensive avian survey was conducted between April 2012 and November 2013 in Boni and Dodori National reserves, the connecting Aweer Community Conservancy corridor, and the adjacent forests. Survey methods were Timed Species Counts (TSCs), mist netting and opportunistic observations. Six different habitat types were identified and sampled: 1) grassland with *Hyphaene* palms 2) a mosaic of forest groves, grassland and *Hyphaene* palm savanna 3) dense thickets 4) wetlands 5) forest with dense undergrowth and 6) acacia woodlands. A total of 184 bird species was recorded, including two near threatened bird species (Southern Banded Snake Eagle *Circaetus fasciolatus* and Fischer's Turaco *Tauraco fischeri*), 19 Palaearctic migrants, two Afrotropical migrants and 14 East African coastal biome species. There were eight forest specialist and 29 forest generalist species. We recorded sightings of a form of Red-naped Bushshrike *Laniarius ruficeps* that is not illustrated in bird guidebooks for Africa, and presumed to be of the subspecies *kismayensis*. Data from this survey led to the upgrading of the Boni-Dodori area from a potential IBA to full IBA status. Even though these forests have species of conservation importance and sufficient habitats to conserve these species, immediate actions need to be taken to ensure their protection. We recommend comprehensive biodiversity surveys in these forests in order to obtain more scientific information such as population trends to enhance the conservation of these important, but neglected sites.

Introduction

Boni and Dodori National Reserves in Garissa and Lamu Counties respectively, and the corridor area between them, form the Boni-Dodori forest system on the northern coast of Kenya (Amin *et al.* 2015). They were gazetted in 1976 and their remote location and history of insecurity have resulted in a comparatively low human population density and minimal development. Five villages (Milimani, Bodhei, Basuba, Mangai and Mararani), occupied by the Aweer (Boni) people, are located along the dirt road from Hindi to Kiunga that runs between the two reserves (Fig. 1). Most of the indigenous coastal habitat in these forests has remained undisturbed and continues to support biodiversity that has been little studied.

As part of the Coastal Forests of Eastern Africa Biodiversity Hotspot, an area known for globally significant levels of species richness and endemism, the Boni-Dodori reserves are recognized as globally important for biodiversity conservation (Burgess & Clarke 2000, Burgess *et al.* 2003, Mittermeier *et al.* 2005). The largest population of the critically endangered Aders' Duiker *Cephalophus adersi* and a potentially new species

of giant sengi (elephant-shrew) have been recorded in these forests (Ngaruiya 2008, Mwenja 2009, KWS 2010, Andanje *et al.* 2010, Amin *et al.* 2015). Additionally, sightings of the endangered Wild Dog *Lycaon pictus* and critically endangered *Hiroloa Beatragus hunteri* have also been recorded in these reserves in the past (Githiru *et al.* 2008).

At the start of this study the two reserves were listed as potential Important Bird Areas (IBAs) (Bennun & Njoroge 1999). Bird species of conservation concern that had been previously recorded included the near threatened Southern Banded Snake Eagle *Circaetus fasciolatus* and Fischer's Turaco *Tauraco fischeri*, as well as many East African Coastal Biome bird species (Bennun & Njoroge 1999). Due to persistent insecurity in the area, there have been very few bird surveys conducted in the forests, and this lack of sufficient data hindered the re-evaluation of the IBA status of these reserves. This survey was part of a Conservation Leadership Programme (CLP) funded project titled *Avifauna survey in Boni-Dodori National Reserves, Adjacent Forests and Community Land, North Coast, Kenya* (Mwinami *et al.* 2013). The objective of the survey was to produce a comprehensive checklist of bird species found in Boni-Dodori and to provide new information that would lead to the reassessment of the conservation status of these reserves.

Study Area

The two national reserves, Boni (1339 km²) and Dodori (877 km²), lie on the northeast coast near the Kenya-Somalia border (01°43'S, 41°10'E; 0–100 m). There are no clear boundaries between the community land and the reserves (Fig. 1). Habitats in the Boni–Dodori forest system consist of a mosaic of forest, thicket and savanna (Kuchar & Mwendwa 1982). We sampled six habitat types classified as: 1) grassland with *Hyphaene* palms 2) mosaic of forest groves, grassland and *Hyphaene* palm savanna 3) dense thicket 4) wetland 5) forest with dense undergrowth and 6) acacia woodland (Appendix 1).

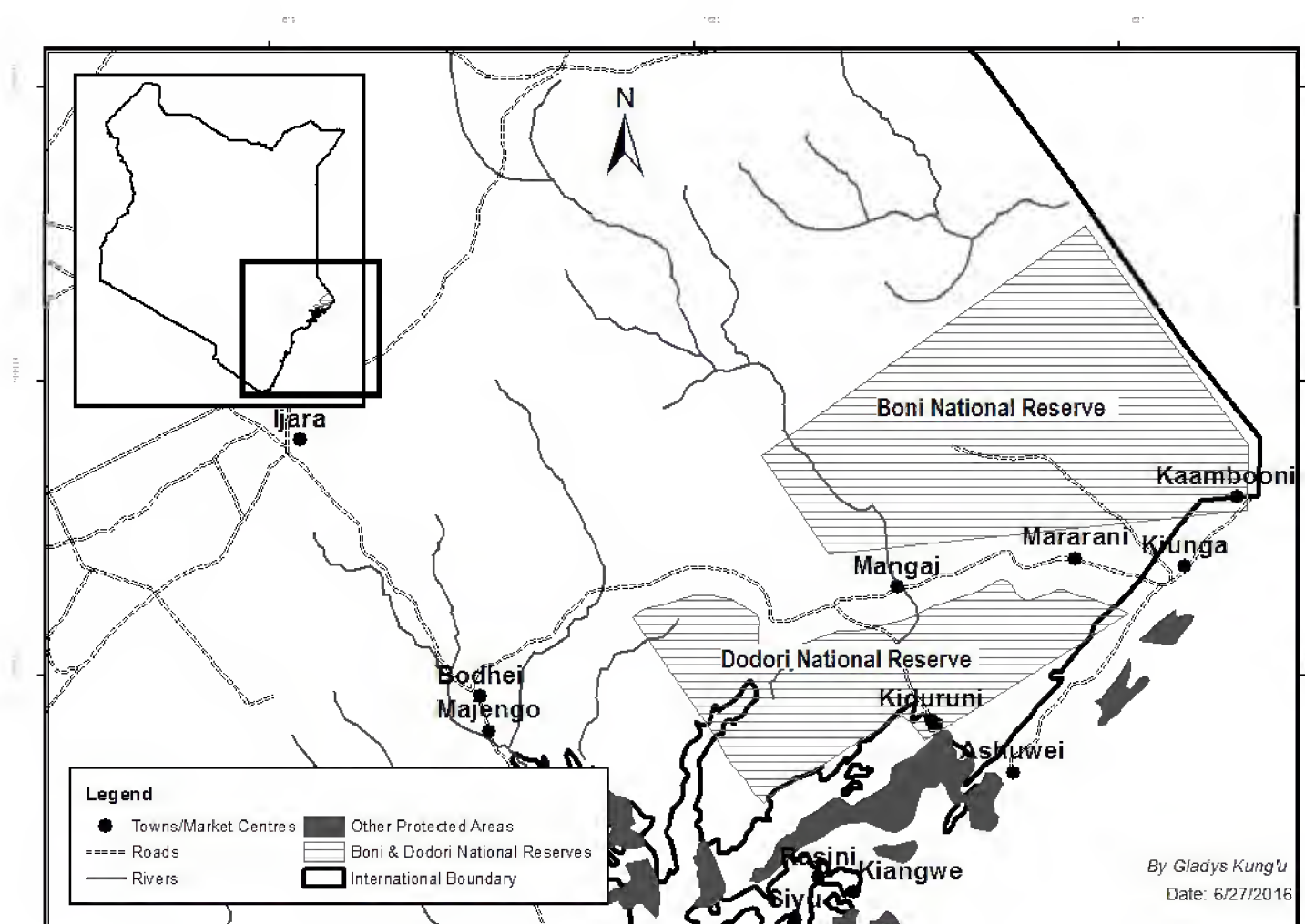


Figure 1. Map of Boni and Dodori National Reserves. Map courtesy of G. Kung'u.

Vegetation communities were classified as distinct if they had, 1) a suite of trees distinct from others 2) grassland cover, or 3) differed from other habitat types in terms of their degree of denseness or openness. Threats to the conservation of each habitat were assessed (Appendix 1).

Bird surveys were conducted in habitats near or around human settlements in Basuba, Mangai and Mararani, in the palm savanna west of Basuba, at Sankuri Ridge, in an acacia woodland area between Mararani and Kiunga towns, and between the main road and Dodori Creek in the Dodori National Reserve. Surveys were only undertaken within about 4 km from the main road to Boni National Reserve, on community lands, and to over 30 km from the main road into Dodori reserve.

Methods

Bird surveys of the Boni-Dodori area were conducted during two separate field surveys, in April 2012 and in October–November 2013. The study employed combinations of three different techniques: timed species counts, mist netting and opportunistic observations. All surveyed sites were geo-referenced for future monitoring and re-survey purposes.

Timed Species Counts

Timed Species Counts (TSCs) are repeated species lists where observers record the first time that each species is first positively identified (Pomeroy & Tengecho 1986, Pomeroy & Dranzoa 1997). They provide an effective and rapid method of counting birds in the mid and upper canopy in large areas (Bennun & Waiyaki 1993, Bennun & Howell 2002). TSCs were undertaken during 27 October to 10 November. Five observers conducted a 60 min walk along a designated path in open habitats at a bird watcher's pace, stopping frequently to identify and record all birds seen or heard and the time (Waiyaki 1995, Bennun & Howell 2002). Counts started by 06:00 and ended at 10:00 or 11:00 when bird activity dropped dramatically. Observers used available paths where possible, but in dense vegetation such as near Mararani and Sankuri Ridge, the observers had to clear their own paths. A total of 40 TSC were done each lasting for one hr.

Mist netting

Mist netting was used on three different days to target species of the forest understorey, which are poorly recorded using other techniques (Bibby *et al.* 1998). Three mist nets, one 18 m long and two 12 m long, were erected at two locations near Mangai village and at one location in acacia woodland near Kiunga. These were operated from 0600 to 1100. Birds trapped were identified, fitted with a metal ring, measured (wing length, head, tarsus, and body weight) and then released. Mangrove Kingfisher *Halcyon senegaloides* and Scaly-throated Honeyguide *Indicator variegatus* were photographed, but not ringed as their tarsi are very short and suitable rings were unavailable.

Opportunistic surveys

Opportunistic records of any bird seen or heard before or after the surveys were noted in order to compile a comprehensive list of the avifauna of Boni-Dodori. This included all species seen or heard at night.

Data analysis

Bird species were classified according to their migratory and conservation status, and were grouped into three other categories according to their forest habitat

niche dependence: forest specialist (FF), generalist (F) and visitors (f) following classifications by Bennun *et al.* (1996).

Relative abundance of each species was calculated from TSCs (Bennun & Howell 2002). Species receive a cumulative score according to when they are first recorded on each count, with species observed more frequently receiving higher mean scores as they tend to occur early within counts as well as in a higher proportion of counts (Bennun & Howell 2002). For each count, each species is assigned an index number ranging from 0–6, depending on whether it was recorded during the first 10 min (= 6), or second 10 min (= 5) down to the last 10 min (= 0). An average score is then taken over all the counts and species with scores closest to 6 being the most abundant species and those with an average score closer to 0 being least abundant.

A discovery curve was derived for species observed during the October–November 2013 survey.

Results

Bird species richness and relative abundance

A total of 184 bird species was recorded which included 19 Palaearctic migrants, two Afrotropical migrants and 14 East African Coastal Biome species (Table 1). The species discovery curve (Fig. 2) indicated an asymptote (maximum) level on day eight, indicating that few new species were likely to be recorded on additional survey days. Relative abundance of each species is indicated by the TSC scores.

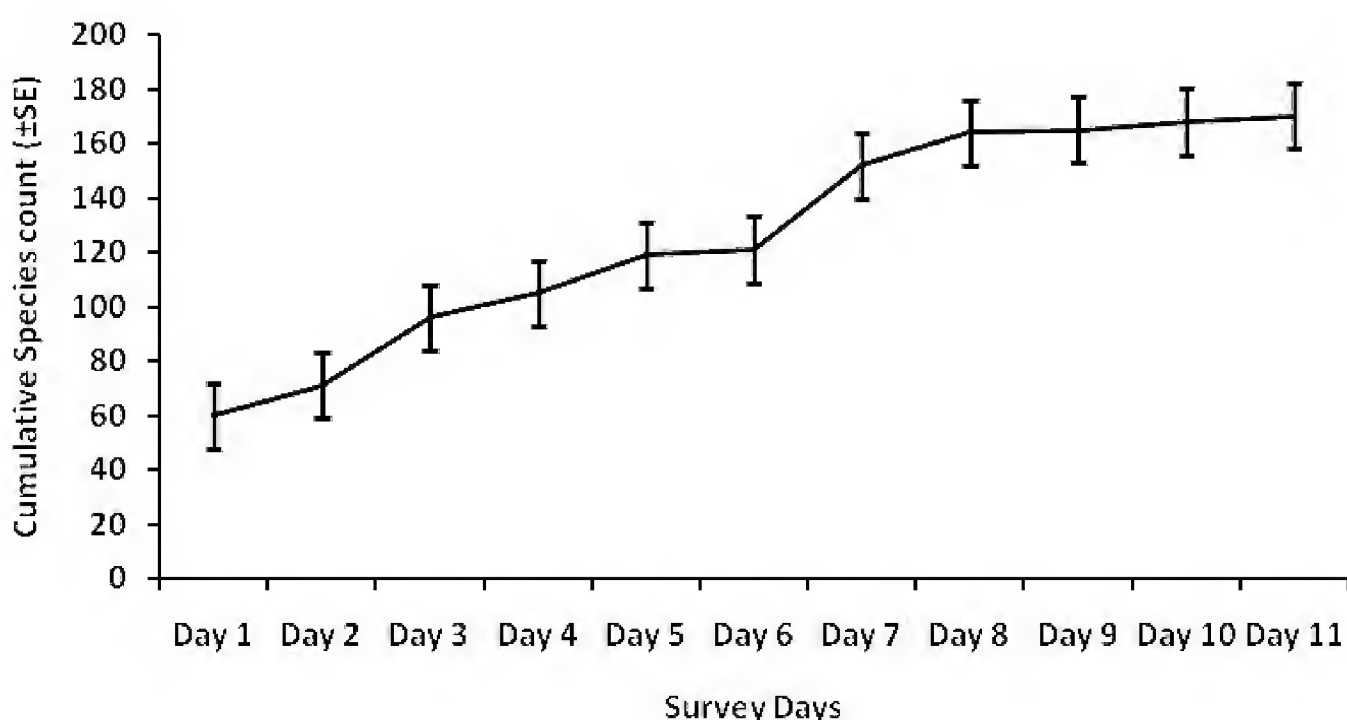


Figure 2. Species discovery curve of birds observed in the Boni-Dodori area over 11 days in October–November 2013.

Two globally threatened species were recorded, Southern Banded Snake Eagle *Circaetus fasciolatus* and Fischer's Turaco *Tauraco fischeri*, both near threatened (IUCN 2012). Ostrich *Struthio camelus*, Forest Batis *Batis mixta* and Gorgeous Bushshrike *Chlorophoneus viridis* were recorded in the Boni-Dodori area for the first time.

The most abundant species from TSC scores were Tropical Boubou *Laniarius aethiopicus* (5.18), Zanzibar Greenbul *Andropadus importunus* (3.48), Yellow-bellied Green-

bul *Chlorocichla flaviventris* (3.30), Collared Sunbird *Hedydipna collaris* (2.75), Common Bulbul *Pycnonotus barbatus* (2.70), Grey-backed Camaroptera *Camaroptera brevicaudata* (2.65), African Paradise Flycatcher *Terpsiphone viridis* (2.63), Emerald-spotted Wood Dove *Turtur chalcospilos* (2.60), Black-backed Puffback *Dryoscopus cubla* (2.58) and Red-fronted Tinkerbird *Pogoniulus pusillus* (2.25). Scores for globally threatened species were: Fischer's Turaco *Tauraco fischeri* (0.65) and Southern Banded Snake Eagle *Circaetus fasciolatus* (0.35).

There were 19 Palaearctic migrants (Table 1) of which Barn Swallow *Hirundo rustica* was the most common (score 1.04). The April 2012 survey recorded the best selection of migrants, many undoubtedly on northward passage. These included migrating Eurasian Rollers *Coracias garrulus* and large flocks of Amur Falcons *Falco amurensis* foraging on insects in the palm savanna. The least common of these migrants was the Yellow Wagtail *Motacilla flava*, recorded on only two TSC counts.

There were two Afrotropical migrants. White-throated Bee-eater *Merops albicollis* was often seen (TSC score 1.30), while Northern Carmine Bee-eater *Merops nubicus* was less frequently recorded (score 0.18). Southern migrants with presumed resident races that were still fairly common in November included Yellowbill *Ceuthmochares aereus* (0.68) and Red-capped Robin Chat *Cossypha natalensis* (0.90).

A total of 14 East African Coastal Biome (EAC) species was recorded (Table 1). Most of these species, especially Mangrove Kingfisher, Mombasa Woodpecker *Campethera mombassica*, Little Yellow Flycatcher *Erythrocercus holochlorus*, Northern Brownbul *Phyllastrephus strepitans*, Fischer's Greenbul *Phyllastrephus fischeri* and Black-bellied Starling *Lamprotornis corruscus* were seen or heard on most survey days and across all habitats except in acacia woodland. Coastal biome sunbirds were concentrated in flowering bushes or trees, especially in *Combretum constrictum* bushes near the river pools. Little Yellow Flycatcher *Erythrocercus holochlorus* was the most common EAC bird with a TSC score of 1.78 closely followed by Northern Brownbul *Phyllastrephus strepitans* (1.73) and Gorgeous (Four-coloured) Bush-shrike *Telophorus viridis* (1.50). The least recorded was the Southern Banded Snake Eagle with a score of 0.35. However, several Southern Banded Snake Eagles were seen opportunistically along the road.

Table 1. Checklist of bird species recorded in and around Boni and Dodori National Reserves Names and sequence according to the Checklist of the Birds of Kenya, 4th Ed, Bird Committee of EANHS, 2009. Habitats types: M= mosaic of forest groves, grassland, and *Hyphaene* palm savanna, sometimes flooded, on white or grey sand; F= dry forest with a few tall trees and dense shrub understory on white or grey sand; T= dense thicket on red sands; A= acacia woodland, coastal scrub, scattered baobabs and small seasonal wetlands on white sand; W= wetlands, including pools in river channel. * indicates East African Coastal Biome species, FF= forest specialist, F= forest generalist, f= forest visitor, AM= Afrotropical migrant, PM= Palaearctic migrant, am/pm= Afrotropical or Palaearctic migrants occurring alongside resident birds, R= resident.

Species	Habitat	Migratory Status	Forest Bird Category
Ostrich <i>Struthio camelus</i>	M	R	
Crested Guineafowl <i>Guttera pucherani</i>	M,F,T	R	F
Crested Francolin <i>Francolinus coqui</i>	M,T,A	R	
Red-necked Spurfowl <i>Francolinus afer</i>	M,T	R	
Harlequin Quail <i>Coturnix delegorguei</i>	M	am	
Egyptian Goose <i>Alopochen aegyptiaca</i>	W	R	
Spur-Winged Goose <i>Plectropterus gambensis</i>	W	R	

Species	Habitat	Migratory Status	Forest Bird Category
White-faced Whistling Duck <i>Dendrocygna viduata</i>	W	R	
African Open-billed Stork <i>Anastomus lamelligerus</i>	W	am	
Woolly-necked Stork <i>Ciconia episcopus</i>	W	R	
Saddle-billed Stork <i>Ephippiorhynchus senegalensis</i>	W	R	
Marabou Stork <i>Leptoptilos crumeniferus</i>		R	
Sacred Ibis <i>Threskiornis aethiopicus</i>	W	R	
Hadada Ibis <i>Bostrychia hagedash</i>	M,A,W	R	
African Spoonbill <i>Platalea alba</i>	W	R	
Black-crowned Night Heron <i>Nycticorax nycticorax</i>	W	am, pm	
Striated Heron <i>Butorides striata</i>	W	R	
Squacco Heron <i>Ardeola ralloides</i>	W	am, pm	
Grey Heron <i>Ardea cinerea</i>	W	am, pm	
Black-headed Heron <i>Ardea melanocephala</i>	W	R	
Great White Egret <i>Ardea alba</i>	W	R	
Yellow-billed Egret <i>Egretta intermedia</i>	W	R	
Little Egret <i>Egretta garzetta</i>	W	R	
Hamerkop <i>Scopus umbretta</i>	W	R	
African Darter <i>Anhinga rufa</i>	W	R	
Amur Falcon <i>Falco amurensis</i> (April 2012)	M	PM	
Common Kestrel <i>Falco tinnunculus</i> (April 2012)	M	PM	
Osprey <i>Pandion haliaetus</i>	W	PM	
Black Kite <i>Milvus migrans</i>	W	am, pm	
African Fish Eagle <i>Haliaeetus vocifer</i>	W,M	R	
Black-chested Snake Eagle <i>Circaetus pectoralis</i>	A	R	
Brown Snake Eagle <i>Circaetus cinereus</i>	M	R	
Southern Banded Snake Eagle <i>Circaetus fasciolatus</i> *	M,F	R	F
Bateleur <i>Terathopius ecaudatus</i>	M,A	R	
African Harrier Hawk <i>Polyboroides typus</i>	M,F	R	f
African Goshawk <i>Accipiter tachiro</i>	F	R	F
Little Sparrowhawk <i>Accipiter minullus</i>	M	R	f
Great Sparrowhawk <i>Accipiter melanoleucus</i>	M	R	F
Lizard Buzzard <i>Kaupifalco monogrammicus</i>	M	R	f
Wahlberg's Eagle <i>Aquila wahlbergi</i>	M	am	
Booted Eagle <i>Aquila pennata</i>	A	PM	
Ayres's Hawk Eagle <i>Aquila ayresii</i>	M	R	F
Black Crake <i>Amauornis flavirostra</i>	W	R	
Water Thick-knee <i>Burhinus vermiculatus</i>	W	R	
Black-winged Stilt <i>Himantopus himantopus</i>	W	am, pm	
Spur-winged Plover <i>Vanellus spinosus</i>	W	R	
Black-headed Plover <i>Vanellus tectus</i>	A,W	R	
Common Ringed Plover <i>Charadrius hiaticula</i>	W	PM	
Three-banded Plover <i>Charadrius tricollaris</i>	W	R	
White-fronted Plover <i>Charadrius marginatus</i>	W	R	
Lesser Sand Plover <i>Charadrius mongolus</i>	W	PM	
Greater Painted-snipe <i>Rostratula benghalensis</i>	W	R	
African Jacana <i>Actophilornis africanus</i>	W	R	
Common Greenshank <i>Tringa nebularia</i>	W	PM	
Green Sandpiper <i>Tringa ochropus</i>	W	PM	

Species	Habitat	Migratory Status	Forest Bird Category
Wood Sandpiper <i>Tringa glareola</i>	W	PM	
Common Sandpiper <i>Actitis hypoleucos</i>	W	PM	
Little Stint <i>Calidris minuta</i>	W	PM	
Curlew Sandpiper <i>Calidris ferruginea</i>	W	PM	
Black-faced Sandgrouse <i>Pterocles decoratus</i>		R	
Red-eyed Dove <i>Streptopelia semitorquata</i>	M,A,W	R	f
Ring-necked Dove <i>Streptopelia capicola</i>	M,A	R	f
Emerald-spotted Wood Dove <i>Turtur chalcospilos</i>	M,F,T,A	R	f
Tambourine Dove <i>Turtur tympanistria</i>	M	R	F
Namaqua Dove <i>Oena capensis</i>	A	R	
African Green Pigeon <i>Treron calvus</i>	M,W	R	F
Fischer's Turaco <i>Tauraco fischeri</i> *	M, F	R	F
White-bellied Go-away-bird <i>Corythaixoides leucogaster</i>	A	R	
Klaas's Cuckoo <i>Chrysococcyx klaas</i>	M	R	f
Diederik Cuckoo <i>Chrysococcyx caprius</i>	M	am	
Yellowbill <i>Ceuthmochares aereus</i>	M,F	am	F
White-Browed Coucal <i>Centropus superciliosus</i>	M,W	R	
African Wood Owl <i>Strix woodfordii</i>	M	R	F
African Barred Owlet <i>Glaucidium capense</i>	M	R	F
Eurasian Nightjar <i>Caprimulgus europaeus</i>	M	PM	
Fiery-necked Nightjar <i>Caprimulgus pectoralis</i>	M	R	F
Slender-tailed Nightjar <i>Caprimulgus clarus</i>	M	R	
African Palm Swift <i>Cypsiurus parvus</i>	M	R	
Little Swift <i>Apus affinis</i>	M	R	
Speckled Mousebird <i>Colius striatus</i>	M	R	
Blue-naped Mousebird <i>Urocolius macrourus</i>	A	R	
Narina Trogon <i>Apaloderma narina</i>	M	R	F
Lilac-breasted Roller <i>Coracias caudatus lorti</i> (Lilac-throated race)	M	am	
Broad-billed Roller <i>Eurystomus glaucurus</i>	M	am	f
Grey-headed Kingfisher <i>Halcyon leucocephala</i>	M	am	f
Striped Kingfisher <i>Halcyon chelicuti</i>	M,W		
Mangrove Kingfisher <i>Halcyon senegaloides</i> *	M,F,A,W		
Malachite Kingfisher <i>Alcedo cristata</i>	W		
Pied Kingfisher <i>Ceryle rudis</i>	W	W	
Little Bee-eater <i>Merops pusillus</i>	M	R	
White-throated Bee-eater <i>Merops albicollis</i>	M,W	AM	f
Northern Carmine Bee-eater <i>Merops nubicus</i>	M,W	AM	
Green Wood-hoopoe <i>Phoeniculus purpureus</i>	M	R	
Common Scimitarbill <i>Rhinopomastus cyanomelas</i>	M,F,T	R	
Crowned Hornbill <i>Tockus alboterminatus</i>	M,F	R	f
African Grey Hornbill <i>Tockus nasutus</i>	M	R	
Trumpeter Hornbill <i>Bycanistes bucinator</i>	M	R	F
Red-fronted Tinkerbird <i>Pogoniulus pusillus</i>	M,T,A	R	
Black-collared Barbet <i>Lybius torquatus</i>	M	R	f
Scaly-throated Honeyguide <i>Indicator variegatus</i>	M,T	R	f
Greater Honeyguide <i>Indicator indicator</i>	M	R	f
Nubian Woodpecker <i>Campethera nubica</i>	M,T	R	
Mombasa Woodpecker <i>Campethera mombassica</i> *	M,F	R	F

Species	Habitat	Migratory Status	Forest Bird Category
Cardinal Woodpecker <i>Dendropicos fuscescens</i>	M	R	
Forest Batis <i>Batis mixta</i>	F	R	FF
Black-headed Batis <i>Batis minor</i>	M,F,T	R	
Retz's Helmetshrike <i>Prionops retzii</i>	M	R	f
Chestnut-fronted Helmetshrike <i>Prionops scopifrons</i> *	M	R	F
Grey-headed Bushshrike <i>Malaconotus blanchoti</i>	M,T,A	R	
Sulphur-breasted Bushshrike <i>Chlorophoneus sulfureopectus</i>	M,T,A	R	f
Gorgeous Bushshrike <i>Chlorophoneus viridis</i> *	M,F,T	R	F
Three-streaked Tchagra <i>Tchagra jamesi</i>	A	R	
Black-crowned Tchagra <i>Tchagra senegalus</i>	M,T	R	
Black-backed Puffback <i>Dryoscopus cubla</i>	M,F,T,A	R	F
Slate-coloured Boubou <i>Laniarius funebris</i>	T,A	R	
Red-naped Bushshrike <i>Laniarius ruficeps kismayensis</i>	A	R	
Tropical Boubou <i>Laniarius aethiopicus</i>	M,F,T,A	R	f
Black Cuckooshrike <i>Campephaga flava</i>	M	am	f
Red-backed Shrike <i>Lanius collurio</i>	M	PM	
Long-tailed Fiscal <i>Lanius cabanisi</i>	M	R	
Black-headed Oriole <i>Oriolus larvatus</i>	M,T	R	f
Common Drongo <i>Dicrurus adsimilis</i>	M,A	R	
Square-tailed Drongo <i>Dicrurus ludwigii</i>	M,F,T	R	F
African Paradise Flycatcher <i>Terpsiphone viridis</i>	M,F,T,A	am	f
Blue-mantled Crested Flycatcher <i>Trochocercus cyanomelas</i>	M,F,T	R	FF
Little Yellow Flycatcher <i>Erythrocercus holochlorus</i> *	M,F,T	R	FF
Pied Crow <i>Corvus albus</i>		R	
Barn Swallow <i>Hirundo rustica</i>	M,T,A,W	PM	
Lesser Striped Swallow <i>Cecropis abyssinica</i>	M	R	
Flappet Lark <i>Mirafraga rufocinnamomea</i>	M	R	
Siffling Cisticola <i>Cisticola brachypterus</i>	M,A	R	
Tawny-flanked Prinia <i>Prinia subflava</i>	M,A	R	f
Yellow-breasted Apalis <i>Apalis flavida</i>	M,T,A	R	f
Black-headed Apalis <i>Apalis melanocephala</i>	M,F	R	FF
Grey-backed Camaroptera <i>Camaroptera brachyura</i>	M,F,T,A	R	f
Grey Wren Warbler <i>Calamonastes simplex</i>	A	R	
Common Bulbul <i>Pycnonotus barbatus dodsoni</i>	M,F,T,A	R	f
Zanzibar Greenbul <i>Andropadus importunus</i>	M,F,T,A	R	
Yellow-bellied Greenbul <i>Chlorocichla flaviventris</i>	M,T,A	R	F
Terrestrial Brownbul <i>Phyllastrephus terrestris</i>	T	R	F
Northern Brownbul <i>Phyllastrephus strepitans</i> *	M,F,A	R	f
Fischer's Greenbul <i>Phyllastrephus fischeri</i> *	M,F,T	R	FF
Tiny Greenbul <i>Phyllastrephus debilis</i> *	F	R	FF
Eastern Nicator <i>Nicator gularis</i>	M,F	R	F
Northern Crombec <i>Sylvietta brachyura</i>	M,A	R	
Scaly Babbler <i>Turdoides squamulata</i> *	M,T	R	
Rufous Chatterer <i>Turdoides rubiginosa</i>	T,A	R	
Wattled Starling <i>Creatophora cinerea</i>	A	am	
Rüppell's Starling <i>Lamprotornis purpuroptera</i>	M	R	
Black-bellied Starling <i>Lamprotornis corruscus</i> *	M		F
Red-tailed Ant Thrush <i>Neocossyphus rufus</i>	M	R	FF

Species	Habitat	Migratory Status	Forest Bird Category
African Bare-eyed Thrush <i>Turdus tephronotus</i>	A	R	
Common Nightingale <i>Luscinia megarhynchos</i>	M	PM	
White-browed Robin Chat <i>Cossypha heuglini</i>	M	R	f
Red-capped Robin Chat <i>Cossypha natalensis</i>	M,F	am	F
Spotted Palm Thrush <i>Cichladusa guttata</i>	M,T,A	R	
Bearded Scrub Robin <i>Cercotrichas quadrivirgata</i>	M,F,T,A	R	f
White-browed Scrub Robin <i>Cercotrichas leucophrys</i>	A	R	
Pale Flycatcher <i>Bradornis pallidus</i>	M,T	R	
Spotted Flycatcher <i>Muscicapa striata</i>	M	PM	
Ashy Flycatcher <i>Muscicapa caerulescens</i>	M	R	F
Lead-coloured Flycatcher <i>Myioparus plumbeus</i>	M	R	f
Eastern Violet-backed Sunbird <i>Anthreptes orientalis</i>	A	R	
Collared Sunbird <i>Hedydipna collaris</i>	M,F,T	R	F
Olive Sunbird <i>Cyanomitra olivacea</i>	M,F,T,W	R	FF
Mouse-coloured Sunbird <i>Cyanomitra veroxii</i> *	M,T,W	R	f
Amethyst Sunbird <i>Chalcomitra amethystina</i>	M	R	f
Violet-breasted Sunbird <i>Cinnyris chalcomelas</i> *	M	R	
Black-necked Weaver <i>Ploceus nigricollis</i>	T,A	R	f
Golden Palm Weaver <i>Ploceus bojeri</i>	M,A,W	R	
Lesser Masked Weaver <i>Ploceus intermedius</i>	A	R	
Village (Black-headed) Weaver <i>Ploceus cucullatus</i>	A	R	
Dark-backed Weaver <i>Ploceus bicolor</i>	M,F,T	R	F
Red-headed Weaver <i>Anaplectes melanotis jubaensis</i> (red Juba race)	M	R	
Red-billed Quelea <i>Quelea quelea</i>	A	am	
Fire-fronted Bishop <i>Euplectes diadematus</i>	A	R	
Red-cheeked Cordon-bleu <i>Uraeginthus bengalus</i>	M	R	
Peters's Twinspot <i>Hypargos niveoguttatus</i>	M	R	F
Yellow Wagtail <i>Motacilla flava</i>	W	PM	
Grey Wagtail <i>Motacilla cinerea</i>	T	PM	F
Golden Pipit <i>Tmetothylacus tenellus</i>	A	R	
Yellow-throated Longclaw <i>Macronyx croceus</i>	M	R	
Yellow-fronted Canary <i>Crithagra mozambica</i>	M	R	
Reichenow's Seedeater <i>Crithagra reichenowi</i>	A	R	

Forest-dependent birds

Eight forest specialists (FF) and 29 forest generalists (F) were recorded. Blue-mantled Crested Flycatcher *Trochocercus cyanomelas*, Little Yellow Flycatcher *Erythrocercus holochlorus*, Fischer's Greenbul *Phyllastrephus fischeri*, Black-headed Apalis *Apalis melanocephala* and Olive Sunbird *Cyanomitra olivacea* were regularly recorded. The least observed of the forest specialists were Red-tailed Ant Thrush *Neocossyphus rufus*, Tiny Greenbul *Phyllastrephus debilis* and Forest Batis *Batis mixta*.

Apparently aberrant Red-naped Bush-shrikes

During the November 2013 survey, an apparently aberrant form of Red-naped Bushshrike *Laniarius ruficeps*, race *kismayensis*, was observed at Banahalisi (01°44'S, 41°26'E). The area, characterized by low acacia woodland interspersed with patches of dense scrub on white sand, was located between Mangai village and Kiunga town. Several birds were observed in this habitat. They were black above and white below,

with a prominent white stripe above the eye and a long white patch along the wing. The crown was edged in black, but grey in the centre, with the grey extending to the nape and upper part of the mantle. One bird had a dull rufous area on the grey nape, but the others did not. It seems that the grey of the back typical of *kismayensis* extended in these birds onto the nape in place of the expected red patch (Fig. 3). These birds foraged in bushes, on the ground with Rufous Chatterers *Turdoides rubiginosa*, and in the mid-canopy of acacias. They made several sounds, including a loud crackling, a tac-tac similar to a boubou, and a few musical notes usually answered by a crackling call.

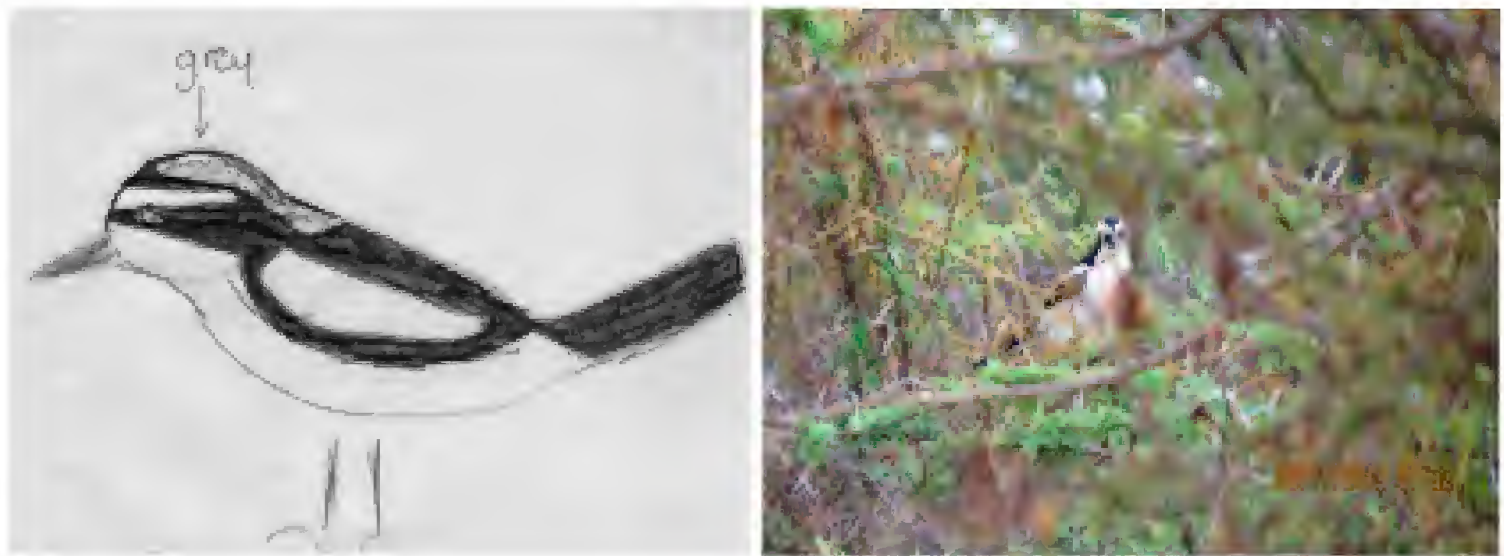


Figure 3. Rough sketch and photograph of Red-naped Bushshrike *Laniarius ruficeps* race *kismayensis* observed at Banahalisi, in acacia woodland between Mangai village and Kiunga town.

We were unable to find an illustration in bird identification guides that exactly matched these birds. *Birds of Africa*, (Fry *et al.* 2000), reveals that whereas the nominate race *ruficeps* from northwest Somalia has a red crown and nape, the other two races, *rufinuchalis* and *kismayensis*, have the crown black and only the nape and hind neck orange-rufous. Most of the birds we observed lacked even this red nape patch.

Discussion

Our study presents the first comprehensive bird survey conducted at Boni-Dodori and highlights the importance of the Boni and Dodori National Reserves for designation as a full IBA. The criteria for designating an IBA include the presence of globally threatened species, or significant bird congregations, or biome-restricted or endemic species (Fishpool & Evans 2001). We confirmed the presence of two globally threatened species in Boni-Dodori, the Southern Banded Snake Eagle and Fischer's Turaco. These species have been recorded in other IBAs along the Kenyan coast (Bennun & Njoroge 1999). Additionally, the Boni-Dodori area recorded 14 East African Coastal Biome species, nearly half of the 30 species of this biome that occur in Kenya (Bennun and Njoroge 1999). Ostrich, Forest Batis and Gorgeous Bushshrike had not been recorded in the Boni-Dodori area in the past and this therefore, represents an extension of their Kenyan range. Data collected during this project (Mwinami *et al.* 2013) has since been used to lift the Boni-Dodori area to full IBA status (Barasa *et al.* 2015), which confirms the importance of these sites for bird conservation.

This survey was conducted in a small section of the Boni-Dodori area, within a period of less than two months in total. A more detailed survey of the interior of this conservation area would yield a more comprehensive checklist of the area's biodiver-

sity. Dodori National Reserve contains important grassland habitat with dense palm trees, which is not found in any other protected area in Kenya. The diverse habitats of Boni-Dodori, though still largely pristine, currently face increasing threats such as habitat burning, which if controlled could safeguard the existing biodiversity. Conservation efforts for these forests should be enhanced to save these threatened and biome-restricted bird species and their ecologically important habitats.

Recommendations

1. Conduct a detailed biodiversity inventory of different habitats within Boni and Dodori National Reserves, Boni and Lungi forests, and the Aweer community land. This would provide more scientific data about the area's biodiversity, cultural information, and local people's utilization of natural resources. This information is crucial for lobbying the government to enhance the protection of these areas.

2. Undertake a comprehensive land tenure and land use mapping of the Boni-Dodori area. Though Boni and Dodori are gazetted as national reserves their boundaries are not clearly defined. Therefore this would include delineating boundaries, defining community areas, and clearly defining biodiversity conservation areas. This could also include mapping the extent of different habitat types.

3. Stakeholders must collaborate to lobby for legal protection of Boni-Dodori and Lungi forests, and Aweer community land. Interested stakeholders include Kenya Wildlife Service, Kenya Forest Service, Zoological Society of London,, Nature Kenya (the East Africa Natural History Society), National Museums of Kenya, World Wide Fund for Nature,, Northern Rangelands Trust, Lamu County, Garissa County and many community livelihood NGOs. These stakeholders should collaborate to focus their efforts on lobbying the government of Kenya to legally protect these sites. Further collaborative fundraising and conservation efforts to save these important coastal forests will likely secure the Boni-Dodori forest system.

4. Improvement of the security situation in the Boni-Dodori area. Research in the Boni-Dodori area and other interventions to ensure that the local community benefits from conservation are dependent on security being improved. At the moment, the area has been declared a danger zone and is under the control of Kenya Defence Forces as they seek to drive Somali militia from the area. It is critical that after the security operation is completed, the Boni-Dodori area reverts to its protected status.

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Tobias Otieno

Ewaso Lions Project, P.O. Box 14996–00800 Nairobi, Kenya, Email: tobymackinen@yahoo.com

Timothy Mwinami

Ornithology Section, National Museums of Kenya, P.O. Box 40658, GPO–00100 Nairobi, Kenya

Martha Ngala, Sandy Oduor and Simon Musila

Mammalogy Section, National Museums of Kenya, P.O. Box 40658, GPO–00100 Nairobi, Kenya

Fleur Ng’weno

Nature Kenya, P.O. Box 44486, GPO–00100, Nairobi, Kenya

Charles Kimwele

Department of Veterinary Anatomy and Physiology, University of Nairobi, P.O. Box 30197–00100 Nairobi, Kenya

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Appendix 1. Habitat types and identified threats.

Habitat types

We identified five main habitat categories during our survey in Boni and Dodori National Reserves and the Aweer Community Conservancy. The following is a brief description of each and the threats facing these habitats as observed during our survey.

1) *Mosaic of forest groves, grassland, and Hyphaene palm savanna (M)*

A mosaic of forest groves, grassland, and *Hyphaene* palm savanna, sometimes flooded, on white or grey sand was the most extensive habitat from Hindi to Sankuri Ridge. It can be subdivided into:

- (a) Grassland dominated by *Hyphaene* palms and *Andropogon* grass species, with occasional thickets of shrubs or small groves of trees. This grassland is seasonally flooded and the shells of *Bulinus* snails and fresh-water crabs were found in the grassland. This is the most extensive habitat along the road from Hindi to Basuba.
- (b) Grasslands without palms, found in patches along the road from Hindi to Kiunga. This grassland is also seasonally flooded.
- (c) Mosaic of seasonally flooded grassland interspersed with forest groves, shrub thickets and palm savanna. This was the dominant habitat from Basuba to Sankuri Ridge. In Dodori National Reserve between Basuba and Kiungwe the forest groves were relatively small, whereas east of Mangai village the forest groves were extensive, with some large trees. Trees in the forest groves included *Tamarindus indica*, *Manilkara sulcata*, *Azizelia quanzensis*, *Brachylaena huillensis*, *Terminalia spinosa*, *Croton megalocarpoides*, *Mimusops* sp., *Ficus* sp., *Euphorbia* sp. and large *Acacia* sp.

2) *Dry forest with a few tall trees and dense shrub understorey (F)*

The dry forest was comprised of a few tall trees and a dense shrub understorey on white or grey sand. The tree species included *Brachylaena huillensis* (Muhugu), *Manilkara sulcata*, *Oldfieldia somalensis*, *Azizelia quanzensis*, among others. Dry forest occurred in the following forests and fragments: Pichankwenge forest, Chuka fragment, Tambaya fragment, Humbi fragment and Jilokonadhi. At Jilokonadhi the forest extended further north, but because of the slow progress through the dense understorey we could not survey it all. Overall the habitat structure consisted of trees whose average height was about 30m and interlaced with lianas. The canopy cover was about 40% with light penetration of about 60%.

3) *Dense thicket habitat on red sands*

This habitat had shrubs less than 3m high and scattered trees among bushes growing to 5m or more. The undergrowth of intertwined shrubs and lianas was thick and difficult to penetrate. It is found on red soils on Sankuri Ridge, which runs north to south. *Fernandoa magnifica* trees with large red flowers and *Ochna* shrubs with yellow flowers grew on the edge of the thicket on Sankuri Ridge.

4) *Acacia woodland habitats with coastal scrub and scattered baobabs*

An acacia-dominated thicket about 4 m high, with ground either bare or covered with short dry grass. People and animals can easily walk through it. The habitat extends about 7 km along the Hindi-Kiunga road starting from Kiunga. The acacia woodland/thicket alternates with areas of dense coastal scrub, small circular seasonal wetlands and scattered baobabs *Adansonia digitata*.

5) *Wetlands, including pools in river channel*

This habitat consisted of both seasonal and permanent wetlands. Wetlands were found in Kibokoni fragment at 01°80'S, 041°17'E and 01°79'S, 041°18'E. These two wetlands were separated by an accumulation of sand and animal grazing fields. Other sites were in Abdimfale fragment, Gogo Fragment and Humbi swamp. In the acacia woodland there were several small circular seasonal wetlands, tapped for water by the local people, but dry at the time of our survey.

Threats to habitats and biodiversity

The main habitat threats during the time of our survey included shifting cultivation, which involves uncontrolled vegetation burning, selective pit sawing, and a lack of a clear formal conservation strategy for these forests. In the ensuing years new threats have emerged, including a land rush triggered by the LAPSSET (Lamu Port South Sudan Ethiopia Transport Corridor) project and the security situation.

1) *Expanding farming and vegetation burning*

The Aweer or Boni people are mainly of Cushitic origin and in the past subsisted on forest products such as honey, bushmeat, wild plants and fruits for consumption and medicinal purposes. However, they are changing their traditional livelihoods to crop production, and use fire to clear farming areas. Because most of the soils in this area are infertile and mostly sandy, they lose their fertility after a few years leading to the opening of more areas. Cultivated areas were found mostly along the road, especially in Baragoni, Milimani, Basuba, Mangai, Mararani and Kiungwe. Others were encountered in Baure fragment and Basuba fragment. Slash and burn to clear the land for agriculture is increasing in the Boni-Dodori area as people from other ethnic groups move into the area. The community also uses fire to control ticks and to scare away animals such as snakes, mostly within the grassland habitat.

2) *Illegal logging and pit-sawing*

Cut trees, mainly large hardwoods, were encountered in the forest. The main tool used by loggers was a saw. It was not possible to verify the extent of this threat to dry forests, but most likely it is increasing due to an influx of people from Kilifi and Lamu counties.

3) *Overgrazing*

The grassland habitats without palms, between Baragoni and Milimani on the Hindi to Kiunga road, were the grazing area for a lot of livestock. Hence, the habitat was heavily grazed and grasses in most portions were also burned as a means of controlling ticks. This habitat had large populations of wild mammals, which must be facing both competition for forage from livestock and the risk of poaching.

Gazetteer

TSC Site name	Reserve	Coordinates
Abdimafale	Dodori	1°75'S, 41°18'E
Acacia woodland/thicket	Boni and Dodori	1°44'S, 41°28'E
Bana Halisi	Boni	1°44'S, 41°06'E
Basuba farms	Boni	1°46'S, 41°02'E
Bauri	Dodori	1°43'S, 40°58'E
Chuka	Dodori	1°47'S, 41°02'E
Dodori grassland	Dodori	1°46'S, 41°02'E
Elwango	Boni	1°45'S, 41°02'E
Gogo	Boni	1°73'S, 41°17'E
Hindi	outside reserves	1°46'S, 41°02'E
Humbi-Boni	Boni	1°45'S, 41°10'E
Humbi-Dodori	Dodori	1°73'S, 41°21'E
Humbi Dried Swamp	Boni	0°66'S, 38°84'E
Humbi Forest	Boni	1°43'S, 41°13'E
Kibokoni A	Dodori	0°18'S, 41°17'E
Kibokoni B	Dodori	1°79'S, 41°18'E
Kilagoni	Dodori	1°45'S, 41°02'E
Mbili Mbili Makame	Dodori	1°83'S, 41°03'E
Mixed thicket	Dodori	1°43'S, 41°22'E
Pichanikwenge	Boni	1°45'S, 41°09'E
Sankari Ridge	Boni and Dodori	1°42'S, 41°22'E
Tambaya	Boni	1°73'S, 41°14'E

Ringling and observation of migrants at Ngulia Lodge, Tsavo West National Park, Kenya, 2013–2015

David Pearson

Summary

The review of migrant bird ringing at Ngulia Lodge by Pearson *et al.* (2014) is updated. During late autumn sessions in 2013, 2014 and 2015 a further 35 000 Palaearctic birds were trapped. Species ringing totals for the three years are tabulated, together with overall ringing totals since the onset of this project in 1969. Twenty long distance ringing recoveries reported since the 2014 review are listed, and a breakdown is given by country of recovery numbers since the start of the project.

Between 25 November and 13 December 2013 regular persistent night mists accounted for a successful session with 21 052 migrants ringed. Marsh Warbler *Acrocephalus palustris* formed 49% of this catch. A Wood Warbler *Phylloscopus sibilatrix* was the first caught here for 20 years. A Thrush Nightingale *Luscinia luscinia*, a Marsh Warbler and a Barn Swallow *Hirundo rustica* were controlled bearing foreign rings. In 2014, a session between 16 November and 2 December produced good species variety, but night mists were confined to the first week. Thrush Nightingale was the dominant species in a modest Palaearctic catch of 7051. Marsh Warbler numbers were unusually low, and one regular species, Basra Reed Warbler *Acrocephalus griseldis*, was almost absent. Heavy showers brought well over 1000 Eurasian Rollers *Coracias garrulus* and a gathering of 1500 Amur Falcons *Falco amurensis* to the lodge on the afternoon of 1 December. In 2015, a late session with nine misty nights between 6 and 20 December resulted in 7638 migrants ringed, with Marsh Warbler by far the dominant species. Basra Reed Warbler numbers had returned to normal, and those of Great Reed Warbler *Acrocephalus arundinaceus* and Sedge Warbler *A. schoenobaenus* were unusually high.

Over three years the bush cover used for trapping north of the lodge has shown continued loss as a result of increased elephant pressure during the dry season.

General Report for 2013–2015

A history of the ringing of Palaearctic birds at Ngulia Lodge, Tsavo West National Park, from its beginnings in 1969, was recently given together with a review of results up to 2012 (Pearson *et al.* 2014). Until 1992 there were regular reports from Ngulia in *Scopus* (Backhurst & Pearson 1977–1993), and it is intended that this tradition should be revived. This paper therefore updates the record and reports on ringing sessions at the lodge in the late autumns of 2013, 2014 and 2015. An additional 35 000 birds have been ringed since Pearson *et al.* (2014) and a further 20 recoveries reported.

Attractions of thousands of migrant passerines to floodlights at Ngulia depend on night mist (low ground level cloud) with or without rain showers under moonless conditions. Ringing sessions are therefore organized over periods of two to three weeks centred over a new moon. They are mostly conducted during the main period of southward migration in November and December, and there has unfortunately

been little recent opportunity to build on the earlier investigations of other months. The varying date of the new moon means that the timing of concerted ringing activity changes within the migration season from year to year. Thus the lodge was manned in 2013 from 25 November to 12 December (new moon 3 December), in 2014 from 16 November to 2 December (new moon 22 November) and in 2015 from 6 to 20 December (new moon 11 December). It was not possible in 2015 to mount an earlier session in mid November as happened with similar new moon timing in 2009 and 2012.

Floodlighting at the lodge for game viewing is now greatly reduced, so to provide the illumination necessary to attract birds in large numbers it has become necessary to employ additional halogen lamps. For the 2013–2015 sessions three additional lamps (3.5kW in total), facing between north and northeast, were set up within 70 m of the north side of the building. The result was comparable with that achieved by the lodge's lights in the early Ngulia years. Catching procedures followed those which have now become standard. At night, two 18 m mist nets were positioned below the floodlights whenever mist was present. Birds were extracted from these continuously, to be ringed, processed and released with minimal delay by one to two ringing teams working within the lodge. An arrangement of about 20 nets (some 18 m, others 9 m or 12 m, *c.* 270 m in all) was then opened shortly before sunrise in the bushy area within 250 m of the lodge on its north side to catch grounded birds dispersing from near the lights. These were open for the next two to three hours, only occasionally longer, and cleared continuously by extractors. Later on some mornings a few nets were opened immediately in front of the building to catch low flying Barn Swallows attracted by taped song lures. The ringing team in the three years numbered up to 26 in 2013, 21 in 2014 and 15 in 2015. About half of the participants were from Kenya, half from overseas, mostly Europe. They are all listed under Acknowledgements.

Success at the lodge depends mainly on the frequency and persistence of night mist. In 2013 there was mist on 13 of the 18 nights covered over a peak migration time, and 21 020 migrants were ringed, the highest annual catch since 2005. But in 2014 eight of the 16 nights proved mist free and the catch of 7051 migrants was consequently rather low. In 2015 mist occurred on nine of the fourteen nights covered, but again only a modest total of 7638 was achieved, due partly to the lateness of this session, in mid December, when migration was undoubtedly tailing off.

The state of the bush and its ability to hold grounded migrants has an impact, particularly on the catches taken after dawn. Cover is typically thin and leafless during November ringing, before the rains cause new growth, but becomes green and luxuriant in December. Habitat in the daytime netting area has been modified greatly by elephants, from continuous bush with few openings in 1995 to grassland with scattered bushes in 2015, with thicket covering only about 20%. These changes were evident by 2008 but have accelerated recently, notably after severe dry seasons in 2013 and 2014, when bushes disappeared and small trees were debarked and destroyed.

The main events and features of each of the three recent sessions are outlined below. The species breakdown of the annual totals is given as Appendix 1, which also shows the overall total since 1969 of each species ringed, and gives scientific names. Recoveries and controls additional to those given by Pearson *et al.* (2014), and reported since September 2013, are listed as Appendix 2. There are now 243 ringing movements of Palaearctic birds involving Ngulia; the number to or from each country is shown in Appendix 3.

25 November–13 December 2013

With rains normally timed, the bush around the lodge was beginning to leaf out at

the start of the session, but had been alarmingly reduced by elephant activity. There were then showers on most days and the remaining cover quickly greened. Mist appeared, often thick and persistent, on all except two of the first 13 nights, and a series of large catches was made once a waning moon in the later hours ceased to affect events. Ringing totals above 2000 were recorded on five dates, with a notable 2990 on 3 December. Over 19000 migrants had been ringed by 8 December, but more variable conditions with only two nights with brief mist added relatively few over the last five days. Marsh Warbler with 49% dominated the session catch, followed by Thrush Nightingale (25%). Notable totals were produced by River Warbler, Irania, Red-backed Shrike, Common Nightingale and Upcher's Warbler. Barn Swallows appeared in front of the lodge by day over the middle of the session and made a substantial contribution. Four Eurasian Rollers were caught but there were few Eurasian Nightjars. A Wood Warbler on 2 December was the first here since 1995. There were three controls of birds wearing foreign rings: a Thrush Nightingale from Norway, a Marsh Warbler from Belgium and a Barn Swallow from Kazakhstan. The overall daytime catch (59% of the total) exceeded that taken at night.

Migrant raptors observed included frequent Steppe Eagles *Aquila nipalensis* (c.30 passing on 27 November), several Lesser Spotted Eagles *Aquila pomarina*, a Greater Spotted Eagle *Aquila clanga* and 2 European Honey Buzzards *Pernis apivorus* on 27th, and occasional Steppe Buzzards *Buteo buteo vulpinus*, Booted Eagles, Grasshopper Buzzards *Butastur rufipennis* and Eurasian Hobbies. Amur Falcons *Falco amurensis* appeared in groups of up to c.80 between 27 November and 7 December. A Levant Sparrowhawk circled over the lodge on 25 November when a Sooty Falcon *Falco color* also passed low overhead, and a male Eurasian Sparrowhawk gave prolonged perched views on 7 December. Afrotropical migrants encountered included many Jacobin Cuckoos *Clamator jacobinus* (up to ten seen in one bush), a Great Spotted Cuckoo *C. glandarius* on 2 December, a Levaillant's Cuckoo *C. levaillantii* ringed on 5 December, and occasional Golden Pipits *Tmetothylacus tenellus*. An adult African Black Swift *Apus barbatus*, new to the ringing list, was presumed to be from a nest on the building.

Bird recording radar equipment was set up by the Swiss Ornithological Institute early in November 2013 and was in operation through much of this session. With data analysis being completed, answers are anticipated to some previously unresolved questions concerning migrants in transit above Ngulia (H. Stark pers. comm.).

16 November–2 December 2014

Despite earlier rain in the area the bush around the lodge was still leafless on 16 November, and appeared scant, with evidence of further elephant destruction. Greening occurred gradually throughout the session but there was no rain until the last three days. Things began in promising fashion, with five nights of excellent mist and over 6000 birds ringed during the first week. These were early season catches, so the dominance of Thrush Nightingale (over half the catch on some days) and the high numbers of typical November species such as Red-backed Shrike, Spotted Flycatcher, Olive-tree Warbler and Common Nightingale were not unexpected. But the relative lack of Marsh Warblers was surprising, bucking the trend of recent years, as was a near absence of Basra Reed Warblers. Eurasian Nightjars, strangely absent, would have been expected to feature more prominently in November. The second week was a disappointing contrast. A changed weather pattern, with cloud movement from the southwest rather than the east, resulted in five successive clear nights. But with brief misty spells on 29 and 30 November, low cloud on 1 December and heavy

overnight rain on 2 December some 720 more birds were ringed at the end of the session, among which Marsh Warbler and Common Whitethroat now outnumbered Thrush Nightingale. There were few Barn Swallows to net by day, but these included a retrapped bird ringed at the lodge in December 2010. The majority of birds (58%) was caught at night this year.

Raptor observation was rewarding. A few Steppe Eagles, occasional Lesser Spotted Eagles, Steppe Buzzards and Booted Eagles, a European Honey Buzzard and a Montagu's Harrier *Circus pygargus* were recorded, as well as a Eurasian Sparrowhawk on 27 November. Groups of up to 150 Amur Falcons were seen almost daily from 18 November, then heavy showers late on 1 December brought hundreds down around the lodge, and an estimated 1500 or more gathered to roost in the Ngulia valley. Sooty Falcons (one-two) were noted on six different dates, a dark Eleonora's Falcon several times over the first days, and Eurasian Hobbies in the rain of 1 December. Two Barbary Falcons *Falco peregrinus pelegrioides* hunted around the lodge on the evenings of 25–27 November. A few Eurasian Rollers appeared at the lights during early misty nights, but remarkable numbers passed the lodge when rains eventually broke. Over 500 were counted moving southeast on the afternoon of 30 November, then over 600 next morning before a heavy afternoon shower brought down well over 1000 more. Birds were perched throughout the Ngulia valley, then moved slowly from bush to bush past the lodge before taking off across the plains to the southeast.

A few Afrotropical nightjars (Plain *Caprimulgus inornatus*, Dusky *C. fraenatus* and Donaldson Smith's *C. donaldsoni*) were ringed at night during the first week. Other presumed migrants or wanderers ringed included Singing Bush Lark *Mirafra cantillans*, Grey-headed Kingfisher *Halcyon leucocephala*, African Paradise Flycatcher *Terpsiphone viridis*, Eastern Nicator *Nicator gularis* and Black Cuckoo Shrike *Campephaga flava*. A Little Sparrowhawk *Accipiter minullus* was only the second ringed at the lodge.

6–20 December 2015



The main net ride with the dead acacia behind, 11 December 2015; this area was densely bushed up to 2010.

Bush was in full leaf and grass already well grown when the session began. Further loss to elephant damage was thus hidden although remaining acacias were now dying.

The session produced nine nights with mist, three of these also with heavy showers, but otherwise there was no rain. The daily catch of migrants exceeded 1000 on only four occasions, but an eventual total of over 7600 was reasonable for a session centred on mid December. On some misty nights there was a surprising

lack of birds at the lights, suggesting that migration was tailing off early. Again there were no foreign controls and no returns from our ringing in previous years. Marsh Warblers accounted for over 64% of the night migrant catch, a dominance perhaps expected this late in the season. Thrush Nightingale passage by contrast was subdued, a complete reversal of the situation in November the previous year. Variety

was good, but ‘early’ passage species such as Olive-tree Warbler, Spotted Flycatcher and Rufous Bush Chat were in short supply, and there were relatively few shrikes. Basra Reed Warbler, with 42 ringed, made a good contribution after its near absence the year before, and two *Acrocephalus* species—Sedge Warbler (26) and Great Reed Warbler (19)—exceeded all previous annual ringing totals. A Eurasian Scops Owl was the first to be netted since 2010, and a few Eurasian Rollers were ringed. It was a poor year for Barn Swallows with never many feeding in front of the Lodge, but Common House Martins were attracted successfully with taped song lures and returned a notable total of 39. The great majority of birds (74%) were taken by day this year and night catches were generally disappointing.

Daily watches produced rather few migrant raptors, as is often the case in December. There were occasional Steppe Eagles, Steppe Buzzards and Booted Eagles, two Lesser Spotted Eagles, a Long-legged Buzzard *Buteo rufinus* on 10 December, and a European Honey Buzzard on 13th. A Sooty Falcon circled over the lodge on 7th and a few small high groups of Amur Falcons were noted between 7th and 11th. The maximum count of passing Eurasian Rollers was of 300 on 14th. Afrotropical migrants included good numbers of Harlequin Quails *Coturnix delegorguei*, up to 10 Jacobin Cuckoos per day (14 caught and ringed) and a Great Spotted Cuckoo on 19th. Three African Black Swifts ringed included two juveniles.

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David Pearson

4 Lupin Close, Reydon, Southwold, Suffolk IP18 6NW, UK

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Appendix 1. Palaearctic migrants ringed at Ngulia Lodge during autumn (October–January). Nomenclature and order follow the *Checklist of the Birds of Kenya*, 4th edition, Bird Committee, Nature Kenya, Nairobi, 2009.

	2013	2014	2015	1969–2015
Little Bittern <i>Ixobrychus m. minutus</i>				8
Black-crowned Night Heron <i>Nycticorax nycticorax</i>				1
Eleonora's Falcon <i>Falco eleonora</i>				1
Eurasian Hobby <i>Falco subbuteo</i>				2
Levant Sparrowhawk <i>Accipiter brevipes</i>				1
Eurasian Sparrowhawk <i>Accipiter nisus</i>				5
Booted Eagle <i>Aquila pennata</i>				1
Corncrake <i>Crex crex</i>				12
Spotted Crake <i>Porzana porzana</i>				1
Great Snipe <i>Gallinago media</i>				1
Green Sandpiper <i>Tringa ochropus</i>				7
Wood Sandpiper <i>Tringa glareola</i>				13
Common Sandpiper <i>Actitis hypoleucos</i>				1
Common Cuckoo <i>Cuculus canorus</i>	1			17
Lesser Cuckoo <i>Cuculus poliocephalus</i>				15
Eurasian Scops Owl <i>Otus scops</i>			1	15
Eurasian Nightjar <i>Caprimulgus europaeus</i>	7	3	1	770
Common Swift <i>Apus apus</i>				2
Eurasian Roller <i>Coracias garrulus</i>	4	2	5	209
Eurasian Bee-eater <i>Merops apiaster</i>				4
Eurasian Wryneck <i>Jynx torquilla</i>				2
Red-backed Shrike <i>Lanius collurio</i>	163	235	44	5833
Isabelline Shrike <i>Lanius isabellinus</i>	33	55	10	2712
Eurasian Golden Oriole <i>Oriolus oriolus</i>				35
Sand Martin <i>Riparia riparia</i>				14
Barn Swallow <i>Hirundo rustica</i>	1551	389	476	27 621
Common House Martin <i>Delichon urbicum</i>	2	2	39	643
Red-rumped Swallow <i>Cecropis daurica rufula</i>				1
River Warbler <i>Locustella fluviatilis</i>	547	84	151	14 829
Savi's Warbler <i>Locustella luscinioides</i>				2
Basra Reed Warbler <i>Acrocephalus griseldis</i>	23	2	42	2600
Great Reed Warbler <i>Acrocephalus arundinaceus</i>	5		19	166
Sedge Warbler <i>Acrocephalus schoenobaenus</i>	3		26	287
Eurasian Reed Warbler <i>Acrocephalus scirpaceus</i>	2		3	209
Marsh Warbler <i>Acrocephalus palustris</i>	10 352	1453	4550	226 082
Eastern Olivaceous Warbler <i>Iduna pallida</i>	13	12	8	1427
Upcher's Warbler <i>Hippolais languida</i>	32	12	5	879
Olive-tree Warbler <i>Hippolais olivetorum</i>	36	40	4	2113
Icterine Warbler <i>Hippolais icterina</i>				11
Willow Warbler <i>Phylloscopus trochilus</i>	192	30	109	6698
Common Chiffchaff <i>Phylloscopus collybita</i>				2
Wood Warbler <i>Phylloscopus sibilatrix</i>	1			10
Blackcap <i>Sylvia atricapilla</i>	3	2	5	155
Garden Warbler <i>Sylvia borin</i>	46	14	28	2041

	2013	2014	2015	1969–2015
Barred Warbler <i>Sylvia nisoria</i>	49	20	28	2417
Common Whitethroat <i>Sylvia communis</i>	2335	1176	1054	104 027
Thrush Nightingale <i>Luscinia luscinia</i>	5270	3268	908	115 180
Common Nightingale <i>Luscinia megarhynchos</i>	76	48	16	2528
Iranian Warbler <i>Irania gutturalis</i>	265	107	96	9557
Rufous Bush Chat <i>Cercotrichas galactotes</i>	4	9	3	1686
Common Redstart <i>Phoenicurus phoenicurus</i>				13
Whinchat <i>Saxicola rubetra</i>				4
Isabelline Wheatear <i>Oenanthe isabellina</i>			1	167
Northern Wheatear <i>Oenanthe oenanthe</i>		4		240
Pied Wheatear <i>Oenanthe pleschanka</i>		1		132
Common Rock Thrush <i>Monticola saxatilis</i>	8	11	2	574
Spotted Flycatcher <i>Muscicapa striata</i>	28	71	3	3280
Yellow Wagtail <i>Motacilla flava</i>				12
Tree Pipit <i>Anthus trivialis</i>			1	110
Red-throated Pipit <i>Anthus cervinus</i>				2
Ortolan Bunting <i>Emberiza hortulana</i>				2
Red-backed Shrike x Isabelline Shrike hybrid	1	1		27
Barn Swallow x Common House Martin hybrid				1
Blyth's Reed Warbler <i>Acrocephalus dumetorum</i> x Marsh Warbler hybrid				1
Total	21 052	7051	7638	535 418

Appendix 2. Recoveries and controls reported between September 2013 and May 2016 involving Ngulia, 3°00'S, 38°13'E.

Barn Swallow *Hirundo rustica*

Almaty	20.09.13	4	Chokpak Ornithological Station, Kazakhstan , 42°31'N, 70°38'E
LA28382	05.12.13	R	Ngulia, 11:00, 6051 km, 76 d

Marsh Warbler *Acrocephalus palustris*

Stockholm	01.12.10		Ngulia, 03:00
CP7625?	10.08.14	X	Hotat Sudair, 150 km N of Riyadh, Saudi Arabia , 26°10'N, 46°40'E, 3366 km, 1718 d

[Last digit of the ring number not given, probably this species, but possibly *S. communis*]

Stockholm	12.12.12	4	Ngulia, 03:00
XA07714	06.08.14	+	Hayania, Ha'il, Saudi Arabia , c. 27°30'N, 41°40'E, c. 3400 km, 554 d
Bruxelles	09.08.13	3	Korbeek-Lo, Vlaams-Brabant, Belgium , 50°51'N, 04°45'E
13066956	28.11.13	R	Ngulia, 01:00, 6774 km, 91 d
Stockholm	10.12.13	4	Ngulia, 03:00
XA24386	16.08.14	+	Ar'ar, Northern Prov., Saudi Arabia , 30°59'N, 41°02'E, 3788 km, 249 d
Stockholm	06.12.08	4	Ngulia, 06:00
CL15614	07.06.15	R	Monte Peregro-Curtetone, Montova, Italy , 45°10'N, 10°41'E, 6004 km, 2374 d

Our second Marsh Warbler recovery to Italy, and a particularly long-lived bird.

<i>Stockholm</i>	10.12.10	3	Ngulia, 03:00
CP85260	08.08.15	X	Al Ain, Abu Dhabi, UAE , c. 24°15'N, 55°45'E, 3572 km, 1702 d
<i>Stockholm</i>	04.12.13	3	Ngulia, 00:00
XA18308	(15.05.15)	X	Near Ibri, Dhahirah, Oman , 23°17'N, 56°54'E, 3553 km, 527 d
<i>Stockholm</i>	08.12.12	4	Ngulia, 06:00
XA06365	17.08.15	XF	Al Zulfi, Riyadh, Saudi Arabia , 26°30'N, 44°41'E, 3351 km, 982 d
<i>Stockholm</i>	28.11.13	3	Ngulia, 06:00
XA10854	24.08.15	A	Rafha, Northern Borders, Saudi Arabia , 29°35'N, 43°35'E, 3665 km, 649 d
<i>Stockholm</i>	09.12.15	3	Ngulia, 06:00
XA31857	27.05.16	R	Naszály, Komárom-Esztergom, Hungary , 47°42'N, 18°17'E, 5958 km, 170 d

Upcher's Warbler *Hippolais languida*

<i>Stockholm</i>	25.11.11	3	Ngulia, 06:00
CP92217	12.08.14	?	c. 80 km NW of Riyadh, Saudi Arabia , 25°34'N, 45°51'E, 3279 km, 991 d

Barred Warbler *Sylvia nisoria*

<i>Stockholm</i>	05.12.13	4M	Ngulia, 03:00
2XH7450	(25.04.14)	?	Near Ha'il. Ha'il Prov., Saudi Arabia , c. 27°30'N, 41°40'E, c. 3409 km, c. 500 d

Thrush Nightingale *Luscinia luscinia*

<i>Stockholm</i>	21.11.12	3	Ngulia, 03:00
2XH1034	(05.09.14)	+	60 km SE of Uwayquilah, Northern Border, Saudi Arabia , 31°01'N, 42°22'E, 3805 km, 272 d
<i>Stavanger</i>	01.08.13	3	Borrevanet, Vestfold, Norway , 59°23'N, 10°26'E
EF55470	29.11.13	R	Ngulia, 03:00, 7347 km, 120 d
<i>Stockholm</i>	02.12.13	4	Ngulia, 02:00
2XH6677	09.09.14	A	Ekdu, Beheira, Egypt , 31°19'N, 30°14'E, 3906 km, 281 d
<i>Stockholm</i>	06.12.13	4	Ngulia 06:00
2XH6937	11.09.14	A	Ekdu, Beheira, Egypt , 31°19'N, 30°14'E, 3906 km, 279 d
<i>Stockholm</i>	01.12.13	3	Ngulia, 04:00
2XH2937	27.05.15	A	Kostroma, Kostroma Ob., Russia , 57°50'N, 40°58'E, 6764 km, 542 d

Our furthest north Russian recovery.

<i>Stockholm</i>	21.11.12	3	Ngulia, 06:00
2XH1164	14.08.15	A	Taganrog, Rostov Ob., Russia , 47°14'N, 38°53'E, 5581 km, 996 d
<i>Stockholm</i>	25.11.11	4	Ngulia, 00:00
2KS18210	03.05.16	R	Kizilirmak Delta, Samsun, Turkey , 41°39'N, 36°05'E, 4964 km, 1634 d

Appendix 3. Number of all recoveries and controls involving Ngulia to and from each country to March 2016.

Austria	3	Luxembourg	2
Belarus	1	Malawi	4
Belgium	18	Mozambique	3
Botswana	1	Netherlands	3
Czech Republic	15	Norway	2
Denmark	3	Oman	11
DR Congo	1	Pakistan	1
Egypt	11	Poland	1
Ethiopia	1	Russia	19
Finland	4	Saudi Arabia	45
France	3	Slovakia	1
Georgia	2	Slovenia	6
Germany	18	Sweden	5
Hungary	5	Switzerland	1
Iran	2	Syria	5
Israel	4	Tanzania	3
Italy	3	Turkey	2
Jordan	1	Ukraine	4
Kazakhstan	8	United Arab Emirates	2
Kenya	1	Yemen	4
Kuwait	3	Zambia	4
Lebanon	5	Zimbabwe	1
Lithuania	1	Total	243

Birds of Golden Pride Project area, Nzega District, central Tanzania: an evaluation of recolonization of rehabilitated areas

Chacha Werema, Kim M. Howell, Charles A. Msuya, Jackie Sinclair and Anael Macha

Summary

In Tanzania, the success of habitat restoration in mining areas to create suitable environmental conditions for wildlife is poorly understood. Between March 2010 and December 2014 bird species were recorded at the Golden Pride Project area, a gold mine in Nzega District, central Tanzania. The aims of this study were to document bird communities in the mine area, and to assess the extent to which rehabilitated areas have been recolonised. Mist netting, point counts, timed species counts and opportunistic observations were used to document 181 species of birds at the mine area. These included two species endemic to Tanzania, the Tanzanian Red-billed Hornbill *Tockus ruahae* (treated here as a species separate from *T. erythrorhynchus*, see Kemp & Delport 2002, Sinclair & Ryan 2010) and Ashy Starling *Cosmopsarus unicolor*. Rehabilitated areas had about half the number of species found in the unmined areas. Bird use of areas under rehabilitation suggests that habitat restoration can be used to create corridors linking fragmented landscapes. Results suggest that as the vegetation of the rehabilitated areas becomes more structurally complex, the number of bird species found there will be similar to those in unmined areas. This study provides a baseline for future monitoring, leading to a better understanding of the process of avian colonisation of rehabilitated areas. Furthermore, results imply that in mining areas it is useful to have an unmined area where vegetation is naturally allowed to regenerate, free of human activity. These unmined areas can later act as source habitats from which birds can disperse into rehabilitation areas once the vegetation structure is sufficiently complex.

Introduction

Tropical fauna and flora have suffered declines from a variety of destructive anthropogenic activities. The majority of habitat destruction, in terms of both impact and size, results from agriculture, forestry and urbanization (Hobbs 1993, Adams & Lindsey 2010). To a lesser extent, mining also results in land clearing and conversion, resulting in decreased habitat complexity that negatively affect flora and fauna (Wray *et al.* 1982). Impacts of mining activities range from vegetation clearance to development of mining infrastructure (Lloyd *et al.* 2002).

A number of studies have attempted to assess how birds use rehabilitated areas in different parts of the world. One general conclusion is that bird abundance and species richness of rehabilitated areas increases with rehabilitation age (van Aarde *et al.* 1996a, b; Kritzinger & van Aarde 1998; Armstrong & Nichols 2000; Nichols & Nichols 2003; Nichols & Grant 2007; Gould 2011). In some instances, particularly in older

rehabilitated areas, the composition of bird assemblages can become similar to those found in native forest or natural unmined areas (Brady & Noske 2010; Gould 2011).

The Golden Pride Project (GPP) is a mine owned by Resolute Tanzania Limited (RTL) located in Nzega District, Tabora Region in central Tanzania. Mineral extraction began in 1998 and in 1999 GPP started rehabilitating affected areas. Rehabilitation was a management task of GPP with the goal of rehabilitating the areas for different land uses. Moreover, within the lease area, some parts were not mined (these are termed unmined areas). Before the GPP took tenure, the area was occupied by traditional agriculturalists and cattle herders. After GPP was granted control of the area, all anthropogenic activities, such as cattle grazing and timber harvesting ceased. The unmined areas have undergone natural regeneration to the extent that they are currently closed woodlands owing to restricted human access and use since 1998.

One of the approaches used by the GPP management to restore areas was to reshape the waste rock dumps using heavy machinery. This was followed by deposition of topsoil with a seed bank and planting of native and/or exotic plants. The mine management initially started to replant such areas with over 50 species of plants, including local *Acacia* spp. and the exotic, *Leucaena leucocephala*. Overall, some 70 different species, including native and exotic trees, and vines, were planted in the rehabilitation areas. By the end of December 2014, all affected areas, including the Tailings Storage Facilities (TSFs) had been replanted. The mine area was officially turned over to the Minerals Resource Institute of Tanzania based in Dodoma to create its Nzega Campus on 14 December 2014.

While a number of gold mines in Tanzania exist (e.g., Geita, North Mara, Bulyanhulu and Buzwagi Gold Mines), published studies assessing how birds respond to rehabilitation of mined areas are generally lacking. Given the existing number of mines in Tanzania that may eventually be decommissioned, an understanding of the response of birds to rehabilitation is needed, and is compounded by the fact that no studies have addressed the effectiveness of post-mining management for recovery of bird communities. This is important because studies of this kind are a necessary step towards quantifying the extent to which rehabilitation can be considered to offset the impacts of development. Therefore, GPP's rehabilitation programme provides an opportunity to assess whether habitat restoration can create an environment suitable for birds.

In this study, we compare bird communities between unmined and rehabilitated areas to determine whether rehabilitated areas have attracted avifauna that is similar in composition to unmined areas. Our paper is mainly descriptive and collates data on bird observations that have been recorded at the GPP mine area over five years (2010–2014). In addition, our study provides the first bird list for the Nzega area, even though Reynolds (1968) and Walton (1981) provided an annotated bird list for the Tabora region.

Materials and Methods

The present study was carried out at the GPP area, a gold mine located in the Lusu Ward, Nzega District, Tabora Region, Central Tanzania (Fig. 1). Average annual rainfall is between 700–800 mm per year and average temperatures range from 22° to 27°C (Sinclair & Laughton, 2013).

The study area (total area = 754 ha) consisted of unmined areas composed of naturally regenerated vegetation (296 ha), a one-year old rehabilitated area (45 ha), and

areas that were 4–15 years post-rehabilitation (413 ha) (Fig. 1). Unmined areas had been highly degraded due to timber harvesting and cattle grazing before RTL acquired tenure. They were composed of two woodlands that regenerated naturally after all destructive human activities ceased. One woodland was dominated by *Acacia* spp. and the other by *Brachystegia/Combretum* spp. (H.V. Lyaruu pers. comm.). These woodlands represented the original vegetation communities prior to mining and are thought to be the source habitats of most of the birds colonizing the rehabilitated areas.

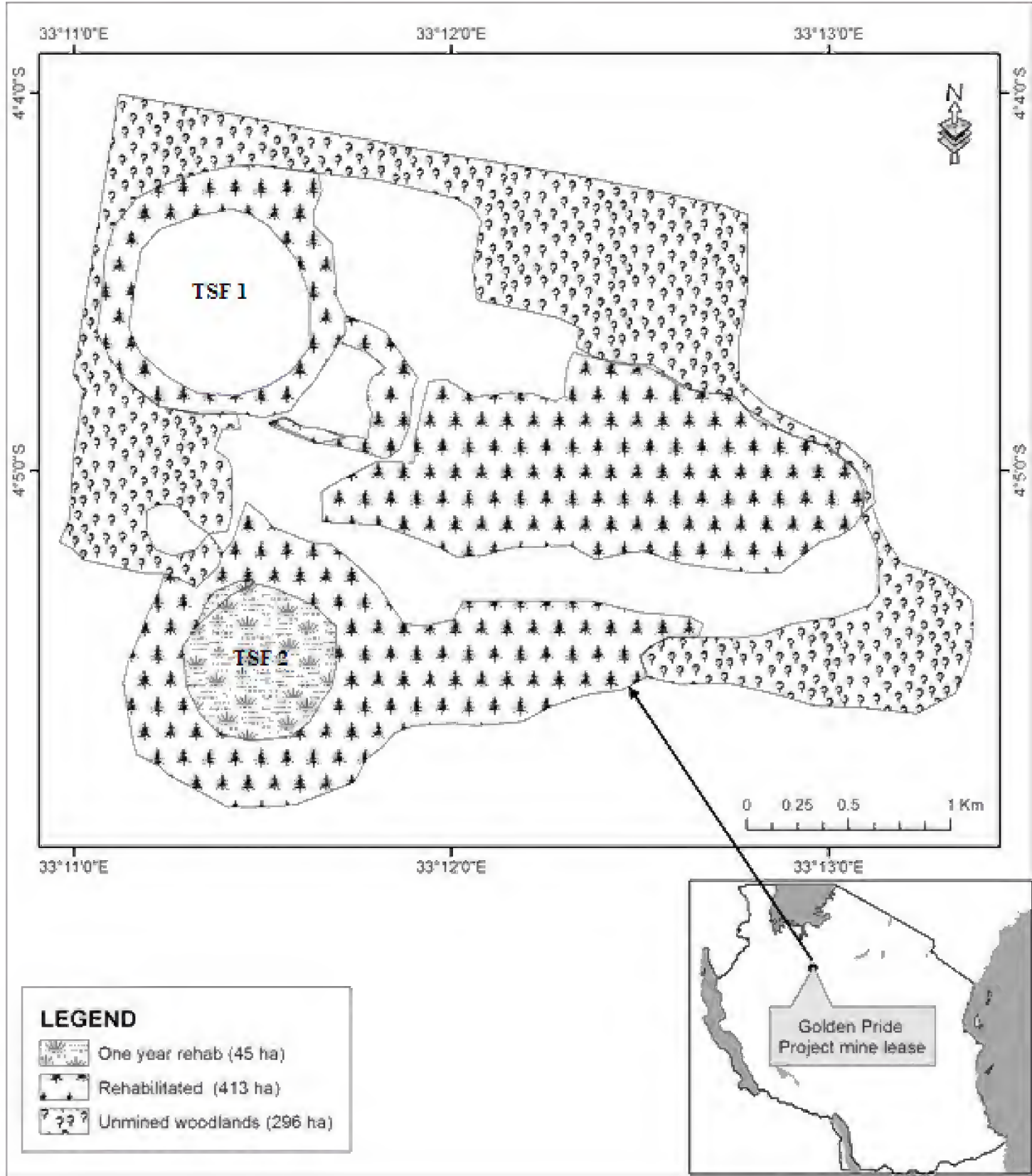


Figure 1. Location of GPP area, Nzega District, central Tanzania. The areas indicated are unmined, one-year rehabilitated area (one-year rehab), 4–15 year post-rehabilitated areas (post-rehab). Also, note that the one-year rehabilitated area was one of the TSFs.

The one-year rehabilitated area was located on one of the former TSFs. TSFs are

embankments constructed from waste rocks which create ponds where tailings are stored. When active, TSFs contain slurry (fine ore particles and cyanide in various forms). The ore particles may settle out and undergo sedimentation creating temporary standing water on TSFs, which may attract wildlife such as birds (see Hadson & Bouwman 2008). The TSFs are now capped with topsoil and during the rainy season there are some small water ponds. The one-year rehabilitated area had young seedlings of *Acacia* spp., *Brachystegia* spp. and some grasses. It is surrounded by the 4–15 years post-rehabilitation area (Fig. 1). We considered the one-year rehabilitated area separately since it had newly planted seedlings of native species, such as *Acacia* spp. and *Brachystegia* spp., and a few water pools and areas with grass cover.

Post-rehabilitation areas had different stages of rehabilitation. The oldest areas (11–15 yrs) were dominated by the exotic *Leucaena leucocephala* and a few *Acacia* spp. The younger areas (4–10 yrs) were dominated by native *Acacia* tree species. All these areas had a few individuals of *Grewia* sp., *Pterocarpus* sp. *Albizia* sp. and the exotic *Azadirachta indica*. The areas under rehabilitation for more than 1 yr differed in their species composition and complexity of vegetation.

Bird surveys at GPP area were conducted during two separate periods, May 2010 and December 2014. We used mist nets (total 720 metre-net-hour), timed species counts (total 15 hr) and point counts (total 21 hr). Mist nets were set both in the unmined and post-rehabilitation areas but not in one-year old rehabilitation. Prior to our first survey in May 2010, a reconnaissance visit was made in March 2010 by two of the authors of this paper (i.e., KMH and CAM). Between these two periods, birds that were seen opportunistically were recorded by JS and AM who were resident at the study site.

In response to queries from interested individuals, CW returned to the study area in December 2015 to confirm the presence of Tanzania Red-billed Hornbill *Tockus ruahae*.

Sorensen's Similarity Index was used to calculate similarity between unmined and two categories of rehabilitated areas (Magurran 1988). Species order, taxonomy and common names follow Sinclair & Ryan (2010).

Results

One hundred and eighty-one species were recorded within the GPP area (Appendix 1). These included all species recorded during field surveys, as well as species recorded during opportunistic observations. The list excludes species that were recorded in the TSFs (i.e., TSF 1 and TSF 2), which will be presented elsewhere (Werema *in prep.*). A total of 40 species were recorded using mist nets, 98 from timed species counts, 92 from point counts and 83 during opportunistic observations. Most species were recorded in unmined areas (n=178), followed by post-rehabilitation areas (n=82), and 13 were found in the one-year-old rehabilitated area (Appendix 1). The Sorensen's similarity index comparing unmined and two categories of rehabilitated areas showed unmined and post-rehabilitation areas shared the most bird species, as compared to the one-year rehabilitated area that was not similar to the other areas (Table 1). Of the bird species observed, 92 occurred exclusively in the unmined area, 3 occurred exclusively in the one-year rehabilitated area; none occurred solely in the post-rehabilitation areas (Appendix 1).

Table 1. Sorensen's similarity indices comparing bird species composition between unmined and rehabilitated areas.

	Unmined	Post-rehabilitation	One-year rehabilitation
Unmined	-		
Post-rehabilitation	0.633	-	
One-year rehabilitation	0.105	0.147	-

Discussion

Our results suggest that the GPP area currently supports a rich avifauna as evidenced by this survey and that of Howell *et al.* (2010). This may be due to a wide range of both naturally regenerated and man-made habitats in the study area. The rich avifauna could also be due partly to the commitment made by staff and management of RTL in conserving the available habitats, in comparison with the surrounding land. Based on satellite maps, the study area has become an "island" of both bushland and woodland in a sea of agricultural lands and villages. As a result, the area appears to have attracted a number of bird species. In addition, the number of species recorded may also be accounted for by the amount of time spent on both field surveys and long-term opportunistic observations. Of particular interest is the presence of Fischer's Lovebird *Agapornis fischeri*, an East African endemic categorised as Near Threatened (BirdLife International 2016). Furthermore, two species endemic to Tanzania, the Tanzanian Red-billed Hornbill (Kemp & Delport 2002, Sinclair & Ryan 2010) and Ashy Starling *Cosmopsarus unicolor* were recorded in the study area. Another species, Ashy Flycatcher *Muscicapa caerulea* was recorded in the unmined woodland and is a range extension for the GPP area (see Stevenson & Fanshawe 2002; Sinclair & Ryan 2010).

There were more species in unmined areas compared to those observed in rehabilitated areas. These findings are similar to those reported by van Aarde *et al.* (1996a & b) and Kritzing & van Aarde (1998) in South Africa, as well as those of Becker *et al.* (2013) in Brazil. This could be due to the complexity of the vegetation in the unmined areas compared to that in rehabilitated areas, affecting availability of food resources, nesting sites and provision of favourable habitat. Our results are in contrast to those of Nichols & Nichols (2003) who found that after eight years the bird community composition of a rehabilitated area in southwest Australia was similar to that of unmined forest. They suggested that the similarity in bird community composition in their study was due to the indistinguishable difference in vegetation composition of rehabilitated and mined areas, which was not the case in our study. Our findings suggest that as vegetation in rehabilitated areas becomes more structurally complex to levels, more similar to that of the unmined areas, both areas may be used by similar bird species (see Nichols & Nichols 2003). It is possible that delayed influx of species into rehabilitated areas is due to factors inhibiting vegetation growth.

Similar to the findings of Gould (2011), our results suggest that at the GPP area, 15 years of rehabilitation have not been sufficient for the number of species of birds to reach a level similar to that of unmined areas. Gould (2011) found that 23 years after rehabilitation commenced, the composition of bird assemblages in post-mining rehabilitations remained significantly different from that of native forest bird assemblages. Our study and that of Gould (2011) imply that under some conditions rehabilitation is a long-term process requiring the commitment of the developer and

government agencies responsible for rehabilitation.

The low similarity indices of the one-year old rehabilitated areas compared to those of the unmined and the 5–15 years post-rehabilitated areas reflect the lower species richness of this habitat. The differences between the three broad habitats in our study presumably account for these observations. Bird species richness in rehabilitated areas is explained by within-site vegetation (Gould & Mackey 2015). Loyn (1985) and Gould & Mackey (2015) found that the vegetation stage at which a bird species enters a revegetated area is related to the development of key vegetation-based habitat resources such as food plants, tree hollows, canopy gaps and leaf litter.

While about half of the species observed in unmined areas were also recorded in rehabilitated areas, all species found in the latter areas were also observed in unmined areas, suggesting that these were the source of the species found in rehabilitated areas. The exclusive presence of three species, the Saddle-billed Stork *Ephippiorhynchus senegalensis*, White Stork *Ciconia ciconia* and Spotted Thick-knee *Burhinus capensis* in the one-year rehabilitated area was probably due to the openness of the area and the presence of some small water ponds. It is possible that these birds occurred in the unmined and post-rehabilitation areas, but they were not recorded during our fieldwork.

Conclusions and implications for bird conservation

Our results provide baseline information that can be used in future long-term monitoring studies to better understand how birds re-establish themselves in rehabilitated areas. Rehabilitated areas at the GPP site have attracted bird species from the surrounding environment, presumably from the nearby unmined areas, the source habitats. Our results suggest that in rehabilitated areas, full habitat diversity and the dependent avian community do not develop within 15 years.

Our study focused on recolonization of mined areas that had undergone or are undergoing rehabilitation. The results do not tell us the time period required for completion of bird recolonization. One of the aspects which we could not address, but which needs to be considered when planning rehabilitation is the impact of climate change. Climatic factors such as total rainfall, and its annual distribution and intensity may vary over time. What effect will these variables have on rehabilitation? Will general climate change make rehabilitated areas more attractive than the surrounding areas and thus “attract” birds to them?

Another observation is that in rehabilitated areas there is a need to replant a variety of indigenous plant species, rather than planting these areas with monocultures of exotic ornamental tree species. These should include fruit-bearing species such as fig trees *Ficus* spp., which are important for frugivorous birds. A recommendation for future rehabilitation programs is to plant a mix of native species to increase species diversity.

The use of rehabilitated areas by birds suggests that restoration can be useful to link isolated patches of natural habitat. Our results suggest that in mining areas it is useful to have some portion of land where natural vegetation is allowed to flourish free of human activities. This may later provide source habitats from which birds can disperse into sufficiently mature rehabilitated areas.

The results of this study show the ability of some avian communities to use rehabilitated areas. It is possible that the patterns presented here and the conclusions obtained reflect what might be expected in other faunal groups such as invertebrates,

amphibians, reptiles and mammals. Therefore, this study calls for further research in order to have a better understanding of the role of rehabilitation on fauna as a whole.

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Chacha Werema, Kim M. Howell and Charles A. Msuya

Department of Zoology and Wildlife Conservation, University of Dar es Salaam, P.O. Box 35064, Dar es Salaam, Tanzania

Jackie Sinclair and Anael Macha

Resolute Tanzania Limited, P.O. Box 78486, Dar es Salaam, Tanzania

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Appendix 1. A list of species recorded at GPP lease area, Nzega District, Tabora Region, central Tanzania. Key: Unmined = unmined areas, Post-rehab = rehabilitated areas of varying age between 4–15 years, 1-year rehab = 1-year old rehabilitated area, x = species present.

Common Name	Species	Unmined	Post-Rehab	One-year Rehab
Hamerkop	<i>Scopus umbretta</i>	x		
Black-headed Heron	<i>Ardea melanocephala</i>	x		
Hageda Ibis	<i>Bostrichia hagedash</i>	x	x	
Marabou Stork	<i>Leptoptilos crumeniferus</i>	x		
Saddle-billed Stork	<i>Ephippiorhynchus senegalensis</i>			x
African Openbill	<i>Anastomus lamelligerus</i>	x		
Abdim's Stork	<i>Ciconia abdimii</i>	x		
White Stork	<i>Ciconia ciconia</i>			x
Black-shouldered Kite	<i>Elanus caeruleus</i>	x		
Black Kite	<i>Milvus migrans</i>	x	x	
Osprey	<i>Pandion haliaetus</i>	x		
Palm-nut Vulture	<i>Gypohierax angolensis</i>	x		
Hooded Vulture	<i>Necrosyrtes monachus</i>	x		
Black-chested Snake-Eagle	<i>Circaetus pectoralis</i>	x		
Bateleur	<i>Terathopius ecaudatus</i>	x		
African Harrier Hawk	<i>Polyboroides typus</i>	x		
Lizard Buzzard	<i>Kaupifalco mongrammicus</i>	x		
African Goshawk	<i>Accipiter tachiro</i>	x	x	
Little Sparrowhawk	<i>Accipiter minullus</i>	x	x	
Tawny Eagle	<i>Aquila rapax</i>	x		
Verreaux's Eagle	<i>Aquila verreauxii</i>	x		
Long-crested Eagle	<i>Lophaetus occipitalis</i>	x		
Martial Eagle	<i>Polemaetus bellicosus</i>	x		
Lanner Falcon	<i>Falco biarmicus</i>	x		
Peregrine Falcon	<i>Falco peregrinus</i>	x		
Helmeted Guineafowl	<i>Numida meleagris</i>	x	x	
Coqui Francolin	<i>Peliperdix coqui</i>	x	x	
Crested Francolin	<i>Dendroperdix sephaena</i>	x	x	
Hildebrandt's Spurfowl	<i>Pternistis hildebrandti</i>	x	x	
Red-necked Spurfowl	<i>Pternistis afer</i>	x		
Small Button-quail	<i>Turnix sylvaticus</i>	x	x	
African Crake	<i>Crexopsis egregia</i>	x	x	
Water Thick-knee	<i>Burhinus vermiculatus</i>	x		
Spotted Thick-knee	<i>Burhinus capensis</i>			x
Crowned Plover	<i>Vanellus coronatus</i>	x		x
Speckled Pigeon	<i>Columba guinea</i>	x		
Red-eyed Dove	<i>Streptopelia semitorquata</i>	x	x	
African Mourning Dove	<i>Streptopelia decipiens</i>	x	x	x
Ring-necked Dove	<i>Streptopelia capicola</i>	x	x	
Laughing Dove	<i>Streptopelia senegalensis</i>	x	x	
African Green Pigeon	<i>Treron calvus</i>	x		
Emerald-spotted Wood-Dove	<i>Turtur chalcospilos</i>	x	x	
Namaqua Dove	<i>Oena capensis</i>	x	x	
Fischer's Lovebird	<i>Agapornis fischeri</i>	x	x	
Yellow-collared Lovebird	<i>Agapornis personatus</i>	x		
Purple-crested Turaco	<i>Tauraco porphyreolopha</i>	x		
Bare-faced Go-away-bird	<i>Corythaixoides personatus</i>	x		
Eastern Grey Plantain-eater	<i>Crinifer zonurus</i>	x		
Diderick Cuckoo	<i>Chrysococcyx caprius</i>	x	x	
Klaas's Cuckoo	<i>Chrysococcyx klaas</i>	x		
Jacobin Cuckoo	<i>Clamator jacobinus</i>	x	x	
Red-chested Cuckoo	<i>Cuculus solitarius</i>	x	x	
White-browed Coucal	<i>Centropus superciliosus</i>	x	x	
Barn Owl	<i>Tyto alba</i>	x		
Verreaux's Eagle-Owl	<i>Bubo lacteus</i>	x		
Square-tailed Nightjar	<i>Caprimulgus fossii</i>	x	x	
Slender-tailed Nightjar	<i>Caprimulgus clarus</i>	x		
Pennant-winged Nightjar	<i>Macrodipteryx vexillarius</i>	x		

Common Name	Species	Unmired	Post-Rehab	One-year Rehab
Speckled Mousebird	<i>Colius striatus</i>	x	x	
Blue-naped Mousebird	<i>Urocolius macrourus</i>	x	x	
Green Wood Hoopoe	<i>Phoeniculus purpureus</i>	x		
Malachite Kingfisher	<i>Alcedo cristata</i>	x		
African Pygmy-Kingfisher	<i>Ispidina picta</i>	x	x	
Grey-headed Kingfisher	<i>Halcyon leucocephala</i>	x	x	
Woodland Kingfisher	<i>Halcyon senegalensis</i>	x		
Brown-hooded Kingfisher	<i>Halcyon albiventris</i>	x		
Rufous-crowned Roller	<i>Coracias naevius</i>	x	x	
Lilac-breasted Roller	<i>Coracias caudatus</i>	x		
Little Bee-eater	<i>Merops pusillus</i>	x		x
Madagascar Bee-eater	<i>Merops superciliosus</i>	x		
European Bee-eater	<i>Merops apiaster</i>	x		
Southern Ground-Hornbill	<i>Bucorvus leadbeateri</i>	x		
Tanzania Red-billed Hornbill	<i>Tockus ruahae</i>	x		
Von der Decken's Hornbill	<i>Tockus deckeni</i>	x		
Crowned Hornbill	<i>Tockus alboterminatus</i>	x		
Red-fronted Tinkerbird	<i>Pogoniulus pusillus</i>	x	x	
Spot-flanked Barbet	<i>Tricholaema lacrymosa</i>	x		
Black-collared Barbet	<i>Lybius torquatus</i>	x		
d'Arnaud's Barbet	<i>Trachyphonus darnaudii</i>	x		
Greater Honeyguide	<i>Indicator indicator</i>	x		
Lesser Honeyguide	<i>Indicator minor</i>	x		
Nubian Woodpecker	<i>Campethera nubica</i>	x	x	
Cardinal Woodpecker	<i>Dendropicos fuscescens</i>	x		
Fischer's Sparrow-Lark	<i>Eremopterix leucopareia</i>	x	x	x
Lesser Striped Swallow	<i>Cercopsis abyssinica</i>	x	x	
African Pied Wagtail	<i>Motacilla aguimp</i>	x		
Yellow Wagtail	<i>Motacilla flava</i>	x		
Black Cuckooshrike	<i>Campephaga flava</i>	x		
Fork-tailed Drongo	<i>Dicrurus adsimilis</i>	x	x	
African Golden Oriole	<i>Oriolus auratus</i>	x		
Black-headed Oriole	<i>Oriolus larvatus</i>	x		
Pied Crow	<i>Corvus albus</i>	x		
Arrow-marked Babbler	<i>Turdoides jardineii</i>	x	x	
Rufous Chatterer	<i>Turdoides rubiginosa</i>	x		
Dark-capped Bulbul	<i>Pycnonotus tricolor</i>	x	x	
Yellow-bellied Greenbul	<i>Chlorocichla flaviventris</i>	x	x	
Eastern Nicator	<i>Nicator gularis</i>	x		
Kurrichane Thrush	<i>Turdus libonyanus</i>	x		
White-browed Robin-Chat	<i>Cossypha heuglini</i>	x	x	
Spotted Palm Thrush	<i>Cichladusa guttata</i>	x	x	
White-browed Scrub Robin	<i>Erythropygia leucophrys</i>	x	x	
Familiar Chat	<i>Cercomela familiaris</i>	x		
White-headed Black Chat	<i>Myrmecocichla arnotti</i>	x		
Northern Wheatear	<i>Oenanthe oenanthe</i>	x		x
Pied Wheatear	<i>Oenanthe pleschanka</i>	x		
Capped Wheatear	<i>Oenanthe pileata</i>	x		
Willow Warbler	<i>Phylloscopus trochilus</i>	x	x	
Rattling Cisticola	<i>Cisticola chiniana</i>	x	x	
Winding Cisticola	<i>Cisticola marginatus</i>	x	x	x
Zitting Cisticola	<i>Cisticola juncidis</i>	x		
Yellow-breasted Apalis	<i>Apalis flava</i>	x	x	
Tawny-flanked Prinia	<i>Prinia subflava</i>	x	x	x
Grey-capped Warbler	<i>Eminia lepida</i>	x		
Red-faced Crombec	<i>Sylvietta whytii</i>	x	x	
Grey-backed Camaroptera	<i>Camaroptera brevicaudata</i>	x	x	
African Grey Flycatcher	<i>Bradornis microrhynchus</i>	x	x	
Silverbird	<i>Empidonax semipartitus</i>	x		
Ashy Flycatcher	<i>Muscicapa caerulescens</i>	x		
African Paradise Flycatcher	<i>Terpsiphone viridis</i>	x	x	
Chinspot Batis	<i>Batis molitor</i>	x	x	

Common Name	Species	Unmined	Post-Rehab	One-year Rehab
Red-backed Shrike	<i>Lanius collurio</i>	x		
Common Fiscal	<i>Lanius collaris</i>	x		
Magpie Shrike	<i>Urolestes melanoleucus</i>	x		
Northern White-crowned Shrike	<i>Eurocephalus rueppelli</i>	x		
Black-backed Puffback	<i>Dryoscopus cubla</i>	x	x	
Brubru	<i>Nilaus afer</i>	x		
Tropical Boubou	<i>Laniarius major</i>	x		
Slate-colored Boubou	<i>Laniarius funebris</i>	x	x	
Orange-breasted Bush-Shrike	<i>Chlorophoneus sulfureopectus</i>	x	x	
Grey-headed Bush-Shrike	<i>Malaconotus blanchoti</i>	x		
Brown-crowned Tchagra	<i>Tchagra australis</i>	x	x	
Black-crowned Tchagra	<i>Tchagra senegalus</i>	x	x	
White-crested Helmet Shrike	<i>Prionops plumatus</i>	x	x	
Greater Blue-eared Starling	<i>Lamprotornis chalybaeus</i>	x		
Ashy Starling	<i>Lamprotornis unicolor</i>	x		
Superb Starling	<i>Lamprotornis superbus</i>	x		
Violet-backed Starling	<i>Cinnyricinclus leucogaster</i>	x		
Yellow-billed Oxpecker	<i>Buphagus africanus</i>	x		
Red-billed Oxpecker	<i>Buphagus erythrorhynchus</i>	x		
Amethyst Sunbird	<i>Chalcomitra amethystina</i>	x		
Scarlet-chested Sunbird	<i>Chalcomitra senegalensis</i>	x	x	
Western Violet-backed Sunbird	<i>Anthreptes longuemarei</i>	x	x	
Collared Sunbird	<i>Hedydipna collaris</i>	x	x	
Variable Sunbird	<i>Cinnyris venustus</i>	x	x	
Beautiful Sunbird	<i>Cinnyris pulchellus</i>	x	x	
Swahili Sparrow	<i>Passer suahelicus</i>	x	x	x
Chestnut Sparrow	<i>Passer eminibey</i>	x		
Cut-throat Finch	<i>Amadina fasciata</i>	x	x	
Red-billed Buffalo Weaver	<i>Bubalornis niger</i>	x		
Speckle-fronted Weaver	<i>Sporopipes frontalis</i>	x		
Grey-capped Social-Weaver	<i>Pseudonigrita arnaudi</i>	x		
Holub's Golden Weaver	<i>Ploceus xanthops</i>	x		
Vitelline Masked Weaver	<i>Ploceus vitellinus</i>	x	x	
Lesser Masked Weaver	<i>Ploceus intermedius</i>	x		
Golden-backed Weaver	<i>Ploceus jacksoni</i>	x	x	
Red-headed Weaver	<i>Anaplectes melanotis</i>	x		
Red-billed Quelea	<i>Quelea quelea</i>	x	x	
Southern Red Bishop	<i>Euplectes orix</i>	x	x	
Black-winged Bishop	<i>Euplectes hordeaceus</i>	x	x	x
Black Bishop	<i>Euplectes gierowii</i>	x		
White-winged Widowbird	<i>Euplectes albonotatus</i>	x	x	
Green-winged Pytilia	<i>Pytilia melba</i>	x	x	
Red-billed Firefinch	<i>Lagonosticta senegala</i>	x	x	
Jameson's Firefinch	<i>Lagonosticta rhodopareia</i>	x	x	
Bronze Mannikin	<i>Spermestes cucullatus</i>	x	x	
Red-cheeked Cordonbleu	<i>Uraeginthus bengalus</i>	x	x	
Blue-capped Cordonbleu	<i>Uraeginthus cyanocephalus</i>	x	x	x
Purple Grenadier	<i>Granatina ianthinogaster</i>	x	x	
Black-faced Waxbill	<i>Estrilda erythronotos</i>	x		
Crimson-rumped Waxbill	<i>Estrilda rhodopyga</i>	x	x	
Pin-tailed Whydah	<i>Vidua macroura</i>	x		
Straw-tailed Whydah	<i>Vidua fischeri</i>	x		
Steel-blue Whydah	<i>Vidua hypocherina</i>	x		
Long-tailed Paradise-Whydah	<i>Vidua paradisaea</i>	x	x	
Broad-tailed Paradise-Whydah	<i>Vidua obtusa</i>	x		
Yellow-fronted Canary	<i>Crithagra mozambica</i>	x	x	
White-bellied Canary	<i>Crithagra dorsostriata</i>	x	x	
Brimstone Canary	<i>Crithagra sulphurata</i>	x	x	
Reichenow's Seed-eater	<i>Crithagra reichenowi</i>	x	x	
Cinnamon-breasted Rock Bunting	<i>Emberiza tahapisi</i>	x	x	
Golden breasted Bunting	<i>Emberiza flaviventris</i>	x	x	
Total number of species per site		178	82	13

Notes on distribution and behaviour of the Rufous-winged Sunbird *Cinnyris rufipennis*

Flemming P. Jensen, Lars Dinesen, David C. Moyer, Elia A. Mulungu and Trevor Jones

Summary

Rufous-winged Sunbird *Cinnyris rufipennis* is known only from Udzungwa Mountains in central Tanzania where it occurs in nine montane forests. Based on field surveys between 2011 and 2014, supplemented by observations made by all authors since the early 1990s, we provide a map showing its distribution and relative abundance. We estimate the size of the core areas where Rufous-winged Sunbird is common to c. 120 km² and the total range to about 200 km². We also provide data that suggests that breeding takes place during the rainy season from November to February with the breeding area usually centred on a forest glade or tree-fall gap. Finally, we describe observations of presumed lekking courtship display with up to three males assembling in a clearing and excitedly hopping from branch to branch, singing aggressively at each other with a single female observing.

Introduction

The Rufous-winged Sunbird *Cinnyris rufipennis* is endemic to the Udzungwa Mountains in Tanzania where it occurs in montane forest habitats in a restricted number of forests. Here we provide new information on its distribution and relative abundance. We also document new observations of its breeding and territorial behaviour including presumed lekking courtship display.

Materials and methods

Observations were collected during field surveys in Udzungwa forests between 2011 and 2014 by FPJ and EAM. This includes visits to northern Mwanihana forest (13 days) in February 2011, northern Uzungwa Scarp forest (4 days with DCM) and Ndundulu-Luhombero forests (4 days) in February 2012, northern Uzungwa Scarp forest (13 days) in February 2013, Iyondo forest (10 days) in September 2013, Ndundulu-Luhombero (5 days) and Ukami forests (2 days) in November 2014. These distributional data and evaluations of relative abundance are supplemented by observations made by all authors since the early 1990s.

Species presence, relative abundance, behaviour and habitat were recorded during walks along forest paths. At a majority of localities observations were supplemented with mist netting and occasional play-back of calls and song were used to help locate this species.

Results and discussion

Distribution

Forest cover on the Udzungwa Mountains is discontinuous with larger forest tracts

separated by woodland and grassland (Fig. 1). Rufous-winged Sunbird is known to occur in nine of these forest tracts: Mwanihana, Ndundulu-Luhombero, Nyumbanitu, Ukami, Iyondo, Kitemele, Kiranzi-Kitungulu, Iwonde and the Uzungwa Scarp forest (Dinesen *et al.* 2001, Butynski & Ehardt 2003).

Prime habitat seems to be tall, undisturbed montane forest. It breeds in tree-fall gaps and other natural forest openings, mainly between 1300 and 1700 m altitude. It forages at flowering plants from forest understory to the canopy, and in glades and tree-fall gaps depending on the season and species of plant in flower.

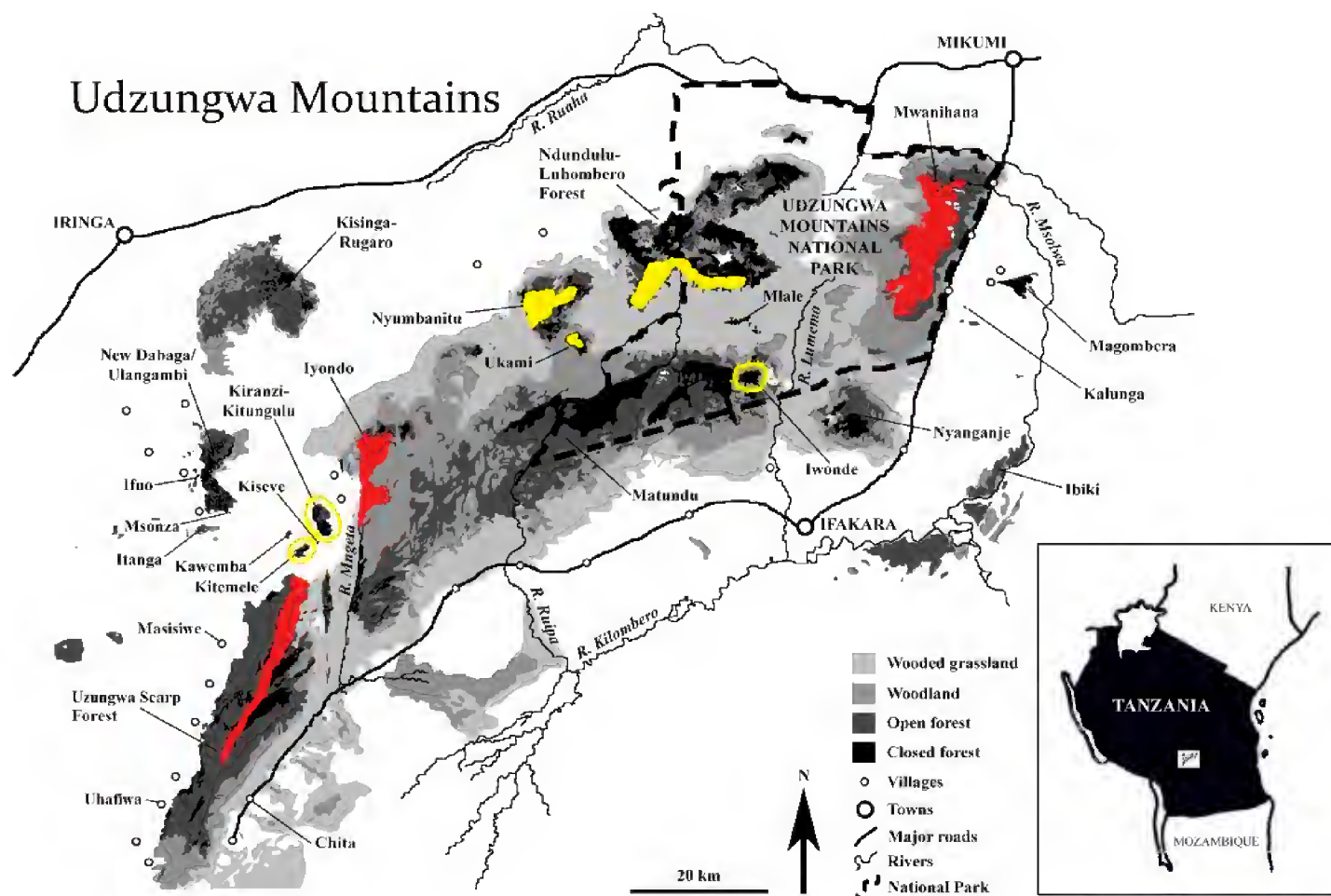


Figure 1. World distribution of Rufous-winged Sunbird. Core areas are marked with red. Areas where it appears to be rare or seasonal are marked with yellow, and forests where it has been recorded too few times to assign a status are outlined with yellow circles. Note that Matundu and Nyang'anje are lowland forests. (Map based on Landsat imagery from Marshall *et al.* 2009).

The breeding range is likely to include Mwanihana, Ndundulu-Luhombero, Nyumbanitu, Ukami, Iyondo and northern Uzungwa Scarp forest. Outside the breeding season in March to September, Rufous-winged sunbirds wander extensively in search of food resources. Observations from Mwanihana Forest down to 600 m in July–August indicate seasonal elevational movement during colder and dryer months, and they are seasonally absent from some higher areas in cold months. In the non-breeding season they have been recorded at low densities in Kitemela and Kiranzi-Kitungulu where they must cross relatively open habitats to reach those forest islands (DCM pers. obs.).

Relative abundance

Rufous-winged Sunbird is generally common in parts of the Uzungwa Scarp forest,

Iyondo and Mwanihana forests. Populations in these core areas (Fig. 1) represent the bulk of this species' numbers. Despite extensive field work near Uhafiwa and Chita in the southern Uzungwa Scarp forest, the species has only been recorded once, in 2012. However, these two field sites were visited seasonally and are at the lower altitudinal limit of the species' typical distribution. The records from September 2012 were made in an extensive area of suitable breeding habitat on the ridge between the field sites that were not a focus of past fieldwork carried out in the area (EAM pers. obs.).

Most of the Ndundulu-Luhombero and Nyumbanitu forests are at higher altitude than the species' normal range. However, even between 1350 and 1600 m in that area, Rufous-winged Sunbird appears to be a low density species (Dinesen *et al.* 1993, 2001). In Nyumbanitu forest it was very rare between 1450 and 1500 m (Dinesen *et al.* 2001).

In late December 1994–January 1995, Rufous-winged Sunbirds were regularly observed in Ukami forest where it was assessed to be fairly common (Dinesen *et al.* 2001). But subsequently it was not recorded during two-day surveys in September 2007 (TJ) and November 2015 (FPJ).

In Kitemele, Kiranzi-Kitungulu and Iwonde it has been recorded too few times to assign a status.

Range size

A range size estimate for Rufous-winged Sunbird was derived from estimates of the closed-canopy forest area in the Udzungwas by Marshall *et al.* (2009). The extent of potential habitat between 1300 and 1700 m was measured using Google Earth Pro. The size of the three core areas (Uzungwa Scarp forest, Iyondo and Mwanihana forests) where the species is common is *ca.* 120 km². The area of forests where it is less common/rare/seasonal (Ndundulu-Luhombero, Nyumbanito and Ukami forests) is *c.* 70 km². The remaining forest patches where the species has been recorded form less than 10 km² in total. Thus, the known total range of the Rufous-winged Sunbird is about 200 km². This may be underestimated by up to 30% as these measurements do not take into account the very steep slopes that are a conspicuous feature of most Udzungwa montane forests (Jones 2013).

Courtship display

In mid-September 2013 observations were made in Iyondo Forest at 1500 m of presumed lekking behaviour similar to the courtship display of Blue-throated Brown Sunbird *Cyanomitra cyanolaema* and Olive Sunbird *Cyanomitra olivacea* (Brosset & Erard 1986, Fry & Keith 2000). Up to three males were repeatedly observed assembling in a clearing in a small open part of the forest with leafless branches and twigs at low height (3–5 m). Here the males hopped excitedly from branch to branch singing aggressively at each other at close range (Fig. 2). A single female was also observed visiting the assembly but it did not participate. After a few minutes of intense singing the males left, but returned to the same site after two to four h for another singing contest.

A few days later a similar behaviour was observed on a mountain ridge at 1850 m altitude in Iyondo Forest. Here two males participated in aggressive singing at *c.* 4 m height in a small tree with open branches and with a single female observing.

Breeding and territorial behaviour

Breeding was recorded during the rainy season from November to February. An active

nest was found near Kihanga Stream in the Uzungwa Scarp forest in November (EAM pers. obs.) and a female was observed feeding a juvenile in Ndundulu-Luhombero Forest in January (Dinesen *et al.* 1993).

In January–February 2012 pairs were observed aggressively defending clumps of flowering plants against other Rufous-winged, Olive, and Collared sunbirds. The areas defended were usually centered on a forest glade or tree-fall gap and probably contained breeding territories. At one such site at 1700m in the northernmost part of Uzungwa Scarp forest, a pair of Rufous-winged sunbirds with two juveniles were observed over a two-day period. The forest glade was about 1000m² and was mostly overgrown with dense 2–3m *Psychotria* sp.



Figure 2. Three male Rufous-winged Sunbirds during courtship display in Iyondo Forest, Udzungwa Mountains, September 2013 (photo: Rasmus Gren Havmøller).

Conclusions

Our records extend the known range of this Udzungwa endemic to include a larger area in Uzungwa Scarp forest and highlight the importance of this forest as well as Iyondo forest as two of the core areas for the species.

Among the core areas Mwanihana Forest is inside the relatively well protected Udzungwa Mountain National Park while Uzungwa Scarp and Iyondo forests are outside the National Park and designated as Forest Reserve and Nature Reserve respectively. These last areas lack law enforcement on the ground (Rovero *et al.* 2015), which has led to an alarming situation with widespread illegal forest destruction and hunting (Rovero *et al.* 2010, pers. obs.). Unless this situation is changed quickly and effective protection is applied in Uzungwa Scarp and Iyondo forests as a matter of urgency by the Tanzanian Government it is feared that the situation could soon become critical for the Rufous-winged Sunbird and the many other Udzungwa endemics which depend on these areas of montane forests.

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Flemming P. Jensen

Ringmarken 10, DK-4623 Lille Skensved, Denmark. Email: fpaghj@gmail.com

Lars Dinesen

Åvej 1, Stridsmølle, 4470 Søebølle, Denmark

David C. Moyer

The Field Museum of Natural History, 1400 S. Lake Shore Drive, Chicago, United States of America

Elia A. Mulungu

P.O. Box 934, Iringa, Tanzania

Trevor Jones

Southern Tanzania Elephant Program, P.O. Box 2494, Iringa, Tanzania

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Short communications

A new record of the Dusky Indigobird *Vidua funerea* from the Kerio Valley, Kenya

While birding in the Kerio Valley, Baringo County, on the morning of 1 March 2012, we observed, photographed and audio-recorded a male and several female indigobirds which we identified as Dusky Indigobirds *Vidua funerea*. There appears to be only one previous record of this species in Kenya (EANHS 2009), and we detail our observations here in support of a second Kenya record.

Field Observations

We found the indigobirds near the Chebloch Gorge (0°27'N, 35°39'E) in an area of open *Acacia-Balanites* dominant woodland with a sparse, mostly rocky ground cover at 1150 m. The birds were observed for five minutes with 7x Zeiss binoculars at a range of 6 to 10 m, during which time the male sang from the ground among some low grass cover and the females perched in an acacia hedge surrounding a small homestead. During our brief observation we did not observe any firefinches *Lagonostica* sp.

Although Dusky Indigobird is morphologically indistinguishable from Purple Indigobird *V. purpurascens* (Zimmerman *et al.* 1996), we immediately noticed the male to be different from Village Indigobird *V. chalybeata*, with which we are quite familiar from elsewhere in Kenya. Prominent features observed include an ivory-coloured and heavier looking bill than in that species, as well as dull salmon-pink feet (Fig. 1). The bird also appeared slightly larger than Village Indigobird, the plumage less glossy and more blue than purple. Female-type birds which were photographed appeared identical to females of other Indigobird species, with no distinguishing field marks.



Figure 1. Male (left) and female (right) Dusky Indigobirds in the Kerio Valley, 1 March 2012.

Vocalizations

We used a Sennheiser ME-67 microphone and Sony digital recorder to make a short recording of the male's song (archived online at www.xeno-canto.org/212710), permitting confident separation from Purple Indigobird. The song comprised the typical chattering notes of an indigobird species, interspersed with a mimetic "twee-too" call and trill call notes common to African Firefinch *Lagonostica rubricata*, which is the breeding host of Dusky Indigobird.

Sonograms of the two mimicked firefinch vocalizations were made and the delivery rate of notes in the purred alarm call was used to confirm the identification (Fig. 2). Payne *et al.* (1993) define the delivery rate of these notes as less than 20 per sec for Dusky Indigobird and more than that for Purple Indigobird. In our recording, the mimetic alarm notes were delivered at a rate of between 13 and 14 notes per sec, which is slower than the alarm trill of Jameson's Firefinch *L. rhodopareia* as mimicked by its brood parasite, Purple Indigobird.

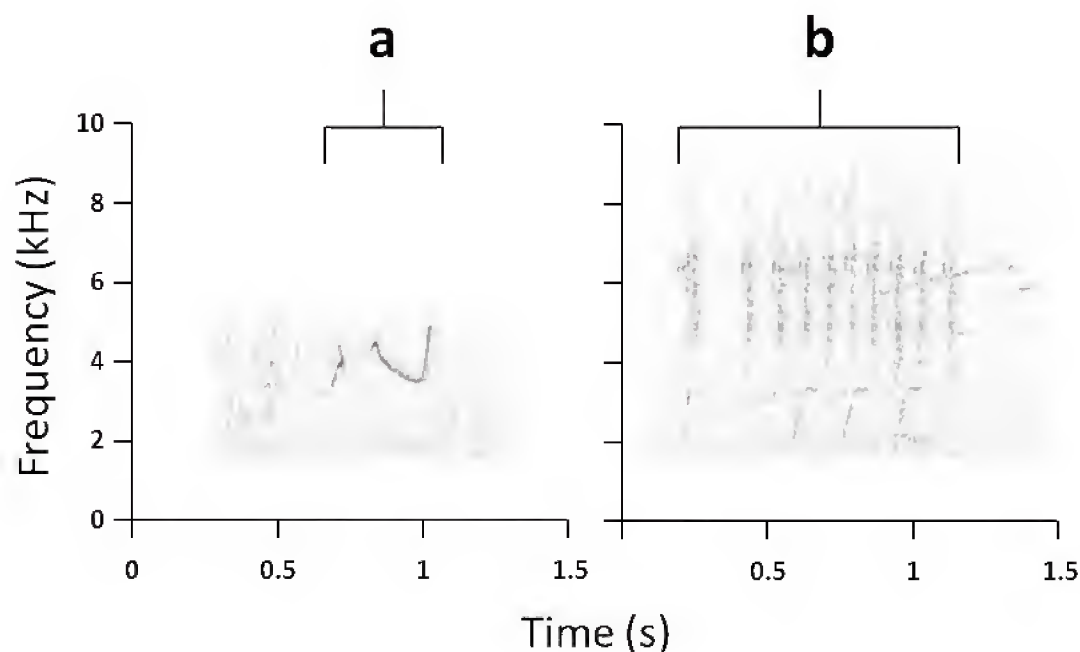


Figure 2. Sonograms of mimicked "twee-tuuee" contact call (a), and "pit-pit" alarm trill (b) made by a male Dusky Indigobird in the Kerio Valley, 1 March 2012.

Independent scrutiny of our recording also supports a likely identification of Dusky Indigobird. Distinguishing characteristics noted include the consistency of whistled and "pit-pit" notes with calls of African Firefinch, as well as the absence of rapid alarm, or flat contact calls common to Jameson's Firefinch and its brood parasite Purple Indigobird (J. DaCosta, pers. comm.).

Summary

The Dusky Indigobird has a primarily southern distribution in Africa, and Kenya represents the northernmost limit of its continental range (Fry & Keith 2004). Although within Kenya its host species is widespread to the south and west of the Kerio Valley, the only previous record is also from the Kerio Valley in 1988 (Payne *et al.* 1992). This bird, which was captured, examined and documented by audio recording (Chappuis 2000), was found alongside both Village and Purple Indigobirds near Biretwo (0°33'N, 35°33'E), approximately 15 km to the northwest of Chebloch and 100 m higher in altitude. Although often difficult to separate from Purple Indigobird,

Dusky Indigobird is clearly rare in Kenya and this small area of the Kerio Valley remains its sole known site of occurrence.

This record has been accepted by the East African Rarities Committee (N. Hunter, EARC Secretary, pers. comm., March 2016).

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James Bradley

10296 Sparling Pl., Sidney, British Columbia, Canada, V8L 0C8. Email: james_bradley@ymail.com

David Bradley

Bird Studies Canada, 5421 Robertson Road, Delta, British Columbia, Canada, V4K 3N2. Email: dbradley@birdscanada.org

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Geographic variation in Hildebrandt's Francolin *Pternistis hildebrandti* with particular reference to the form *altumi* Fischer & Reichenow

In 1878 Jean Cabanis described *Scleroptila hildebrandti* from a female bird collected by Johann Hildebrandt at Ndi in Taita District in July 1877. Six years later in 1884, Fischer & Reichenow described *Francolinus altumi* on the basis of two male birds collected by Fischer from near Korogwe in northeast Tanzania and from Lake Naivasha in Kenya's central Rift Valley, though no type specimen or even a type locality were designated by the authors. It appeared that Fischer did not realise that four birds he collected during his 1883 expedition to Masailand were in fact two males and two females of one species, no doubt deceived by the remarkable difference in both the plumage and size of his specimens. As a result, for several years Hildebrandt's female bird and Fischer's male birds were considered two different species. It was not until 1888 when Harry Hunter visited Moshi in northern Tanzania and trapped considerable numbers, that he quickly realised the marked plumage differences between the sexes of Hildebrandt's Francolin.

Hildebrandt's Francolin ranges from Kenya and northern Tanzania south to northern Zambia, Malawi and Mozambique with three core populations: one largely in and west of the Rift Valley, another in semi-arid rocky areas of northern and eastern Ken-

ya south through the dry interior of Tanzania to the Rukwa depression, and a third from southern and southeast Tanzania, south to Malawi and Mozambique. Plumage variation throughout the range is variable. Hall (1963) commented that the intensity and regularity of the patterning, particularly in females, decreased southwards, birds from the centre of the range, nominate *hildebrandti*, deemed intermediate between southern *johnstoni* and northern *altumi*; also that sexual plumage differences were greatest in *johnstoni* and *altumi*.

Reichenow (1900–01) in his *Die Vögel Afrikas* appeared not to accept the validity of *altumi*, yet this form has been recognized as a subspecies by almost all subsequent authorities (Jackson 1938, Mackworth-Praed & Grant 1955, White 1965, Britton 1980, Zimmerman *et al.* 1996, Dickinson & Remsen 2013 and del Hoyo & Collar 2014). The sole exception was Crowe (1986) who considered that any geographical variation in *hildebrandti* was clinal and not well described by subspecies. A recent examination by the author of specimens at the Tring Natural History Museum, UK, showed that mottling on the mantle and breast in females was most evident in specimens from around lakes Nakuru and Naivasha, but decreased in birds further south, with examples from the Mara-Serengeti, Mts Meru and Kilimajaro showing only a very small amount on the breast.

In conclusion, with variation in the female plumage highly variable and clinal, any sub-specific division within *S. hildebrandti* would seem unwarranted, and as recommended by Crowe (*op cit*) this is best regarded as a monotypic species. Certainly there appears no justification for the recognition of *altumi*, named and described solely on the basis of two male birds, the corresponding females having already been named as *hildebrandti*.

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Donald A. Turner

P.O. Box 1651, Naivasha 20117, Kenya

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Kenya's fifth record of Arabian Bustard *Ardeotis arabs* in Sibiloi National Park

Distribution of Arabian Bustard *Ardeotis arabs* seems to follow the Sahel region, extending from Senegal/Mauritania to extreme northern Kenya, Somalia, as well as in the Arabian Desert in Saudi Arabia and Yemen. According to BirdLife (2016), this species is currently listed as Near Threatened on the basis that it is suspected to be undergoing a moderately rapid decline in population owing primarily to hunting pressure and habitat degradation. Zimmermann *et al* (1996) describes the species as rare in Kenya.

The first record of this species in Kenya was from East Turkana where a pair was collected in January 1932 (Zimmermann *et al.*, 1996). Fifty seven years later, in January 1989, a second record from East Turkana involved an individual photographed near Ileret (Zimmermann *et al.* 1996). Brian Finch has since photographed individuals in West Turkana, near Lokichogio in July 2001, and near Lokichogio in April 2003.



Arabian Bustard photographed near junction 11 in Sibiloi National Park, Marsabit County on 11 February 2015. This is Kenya's fifth (and southern-most) record of this species (Photo: Peter Mikula).

Our record and the fifth of this species in Kenya was on 11 February 2015 in Sibiloi National Park, Marsabit County, along the route from Koobi Fora Field School to Karsa gate, where we had two sightings which we believe were of different individuals, given the c. 30 km distance between the two birds and the species' tendency of preferring walking to flying. The first bird (photographed) was in an area dominated by *Acacia* sp. scrubby bushes with most of the ground bare, but with some short, heavily grazed grass tufts around the base of bushes. Close to this was an open, expansive area of bare ground. The second bird was observed close to Karsa gate where the area was more to less open with rocks scattered across the landscape. This last observation represents the southernmost documented record of this bustard in Kenya. Other bustards recorded in the park were Kori *Ardeotis kori* and Heuglin's *Neotis heuglinii*.

Although Arabian Bustard is described as rare in Kenya (Zimmerman *et al.* 1996), we believe this could be attributed to the few birdwatchers and researchers who visit this vast northern area, and there could also be records that go unreported. From the five record dates (January–July, all from around Lake Turkana), it appears that this largely insectivorous species could be present here for most of the year. A thorough survey in different times of the year may help in understanding its distribution, seasonality and abundance, especially in the Sibiloi National Park.

During this northern Kenya trip, we made bird observations from Laisamis to South Horr, Mt. Kulal, Loiyagalani and Sibiloi National Park (between Karsa gate and Koobi Fora Field School). Some of the highlight species in each locality are reported in Wamiti *et al.* (2015).

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Wanyoike Wamiti

Zoology Department, National Museums of Kenya, P.O. Box 40658-00100, Nairobi, Kenya. Email: wwamiti@gmail.com

Martin Hromada

Laboratory and Museum of Evolutionary Ecology, Department of Ecology, Faculty of Humanities and Natural Sciences, University of Prešov, 17. novembra 1, 081 16 Prešov, Slovakia. Email: martin.hromada@gmail.com

Peter Mikula

Department of Zoology, Faculty of Science, Charles University in Prague, Viničná 7, 128 43 Praha 2, Czech Republic. Email: petomikula158@gmail.com

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Range expansion in the Somali Sparrow *Passer castanopterus* in east and northeast Africa

The Somali Sparrow *Passer castanopterus*, discovered by John Hanning Speke on the Somaliland Plateau back in 1855, is a common and widespread species throughout much of the Horn of Africa, and comprises two widely disjunct populations. The nominate form occurs in northern Somalia, where it is a common and well established resident in coastal towns and villages as well as inland along well-watered riverine valleys, also in villages throughout much of the Ogaden region astride the south-eastern Ethiopia-Somalia border. The race *fulgens* ranges from the Lake Turkana basin in northern Kenya and adjacent Ethiopian border areas south to the Ndotos, Kapedo, the Dida Galgalla, Kaisut and Koroli deserts, Marsabit and Laisamis, and now more recently to the Northern Uaso Nyiro in Isiolo District.

The Somali Sparrow is a highly adaptable species, which at the turn of the last century spread far inland from the Somaliland coast by following the animal food ration convoys supporting the troops engaged in conflict at the time (Ash & Miskell 1998), and today we appear to see a similar expansion of range south from the Marsabit area to the Northern Uaso Nyiro river. In November 2015 a male and female were observed and photographed at a nest at Archer's Post by K. Easley (B. Finch pers. comm.). This extension may have been facilitated by the movement of truck convoys between Marsabit and Isiolo, though several years of prolonged drought in northern Kenya could also have been a contributing factor.

Elsewhere, in January 2013, what appeared to be 2–3 possible Somali x House Sparrow hybrids were photographed at Sala Gate in Tsavo East NP, southeast Kenya (D. Fisher *in litt.*), including an adult feeding a juvenile. This is an arid area many hundreds of kilometres from the nearest known Somali Sparrow localities. House Sparrows reached the Tsavo area during the early 1980's apparently as a result of assisted passage from Kenya coastal towns (Lewis 1983). A solitary male Somali-type sparrow (with bright rufous crown, white cheeks and underparts) was then photographed close to the Galana River in Tsavo East NP in December 2013, within 50 kms of the Sala Gate locality, and to date these remain the sole records of Somali-type sparrows from southeastern Kenya.

In southern Somalia, a Somali x House Sparrow hybrid was reported near the port of Mogadishu in 1980, (Ash & Colston 1981), among a small colony of nominate *P. castanopterus* 206 km southeast of the nearest previously known nominate Somali Sparrow population near Baidoa (03 07N 42 38 E). This could possibly be the source of the Tsavo birds. Elsewhere, mystery and hybrid sparrows have in recent years been reported from Djibouti (Cohen & Mills 2010) and other parts of northwestern Somalia, particularly in areas recently colonized by House Sparrows (N. Redman *in litt.*).

Several observers have remarked on the apparent absence of any yellow on the underparts of the birds photographed in Kenya at Archer's Post (and also on the Tsavo birds), yet a feature of *fulgens* is that it is said to differ from typical *castanopterus* in being more yellowish on the cheeks and underparts, while males have the top of the head and nape brighter cinnamon-rufous, and the upper back with a slightly more greenish tone (Friedmann 1937). Through the kind assistance of Dr Ben Marks, collection manager at the Field Museum of Natural History in Chicago, the 1923 van Someren specimens from Marsabit have been examined, and they too show no trace of yellow on the underparts, and contrast sharply with specimens of *fulgens* from the Lake Turkana basin that clearly show a lemon-yellow wash on the belly and flanks.

With House and Somali Sparrows known to hybridize, and to take advantage of assisted passage by ship, rail or truck, it would seem that these factors could have been responsible for the recent influxes to northern and southeastern Kenya. Regarding the lack of any yellow colouration in the Marsabit and Archer's Post birds it remains to be seen whether this is a stable feature, and whether further subspecific division may be indicated. Meanwhile there remains no conclusive evidence as yet of the occurrence of the nominate race of the Somali Sparrow in Kenya.

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Donald A. Turner

P.O. Box 1651, Naivasha, Kenya 20117

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A breeding record of Abbott's Starling *Cinnyricinclus femoralis* from central Kenya

Abbott's Starling *Cinnyricinclus femoralis* is an East African endemic that inhabits montane forests of northern Tanzania and central Kenya. It is considered Globally Vulnerable (BirdLife International 2015) and little is known of its ecology (Bennun 1994, Feare & Craig 1998). There are very few breeding accounts of this species, with published records of active nests in February, March and October, from only Tanzania and without accompanying details (Brown & Britton 1980, Lewis & Pomeroy 1989). Given the paucity of ecological knowledge of this species, I share some observations of a pair of Abbott's Starlings found tending an active nest in the southern Kikuyu Escarpment forests in November 2015.

On 2 November 2015 at 1030, while birding in an isolated forest patch near the community of Gatwamba (1°03'S, 36°40'E), I first heard, and then visually located a pair of Abbott's Starlings in the high canopy of an African Olive *Olea africana*. The tree, and several like it, was growing adjacent to a forest stream at the bottom of a shallow valley, and towered 30m high or more, extending above much of the surrounding canopy. The birds appeared nervous of my presence, peering at me below them, and I suspected that they could be nesting. On watching them over the following 40 min, I noted the olive-brown female was visiting a nest cavity near the top of a large dead tree, next to and entwined within the canopy of the olive (Fig. 1). The occupied cavity was one of three holes near the terminus, and on the underside of a rotten branch, and I estimated its height above ground at approximately 25–28m. The diameter of the branch was approximately 30–38cm and the cavity itself had a diameter of approximately 7–9cm.

During the course of my observations, the birds behaved in a distinctive and consistent manner. Initially, they would leave the olive to forage together in the canopy of another large tree 200m upstream, before returning after a period of no more than 10 min. The male would then perch 8–10m from the nest cavity, while only the female flew to the nest. On each visit I was unable to see if she was carrying food, although it seemed appropriate to me that this was the case. The female would spend no more than 1 or 2 min in the nest before peering out (Fig. 2), presumably checking the safety of her surroundings, and flying out to alight next to the male. The pair would then fly off to forage again. This sequence of behaviours was repeated three times, and strongly indicated that the female was feeding nestlings in the cavity.

Of interest, the male vocalized regularly while the female was in the nest cavity, with single, well-spaced and sharp "peet" notes, similar to but higher pitched than those made by Sharpe's Starling *Pholia sharpii*. Occasionally, these notes were punctuated by bursts of a tinkling song, which could perhaps be likened to the sound made by the shattering of fine glassware (sound recordings archived at www.Xeno-canto.org); again, similar to but higher pitched than Sharpe's Starling *Pholia sharpii*.



Figure 1. Photo of an African Olive *Olea africana* and adjacent dead tree supporting an Abbott's Starling nest cavity (yellow circle), Kikuyu Escarpment Forest, 2 November 2015.

In addition to the record above, another Abbott's Starling nest was located 7km to the north of this site at Gatamaiyu Forest in October 2005 (Kariuki 2005, unpublished). That nest, like the one described above, was also thought to contain nestlings and it would appear that October–November could be the main breeding season for this species in central Kenya. It is also possible that old and tall emergent trees are favoured for nest sites and this possible requirement should be investigated further. Such trees are often rare, and patchily distributed within forests, and the availability of suitable cavities may be a limiting factor for population growth in this species.



Figure 2. Photo of female Abbott's Starling peering out of the nest cavity in a rotting branch, Kikuyu Escarpment Forest, 2 November 2015.

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James Bradley

10296 Sparling Pl., Sidney, British Columbia, Canada, V8L 0C8. Email: james_bradley@ymail.com

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Buffalo weavers *Bubalornis* in eastern Africa

The genus *Bubalornis* comprises birds with whitish, yellow-brown, black and reddish bills, and in his *Systema* Sclater (1930) treated all forms as geographical races of *Bubalornis albirostris*, whose range stretched across the Northern Tropics of Africa from Senegal to Ethiopia, meeting with *intermedius*-type birds in South Sudan, northeastern Uganda and southern Ethiopia. Later, van Someren (1922) and Mackworth-Praed & Grant (1955) recognized two species, the White-billed *B. albirostris* and the Red-billed *B. niger*, with two subspecies, nominate in southern Africa and *intermedius* from eastern Ethiopia and Somaliland south through eastern Kenya to northeastern Tanzania.

As mentioned by Archer & Godman (1961), there can be no difficulty in recognizing *B. niger intermedius* when seen. The plumage of the male is black with white bases to the feathers often showing through as white patches when disarranged. There are also white margins to the primaries, the basal third of the wing-lining being white. Archer & Godman (*op. cit.*) further commented that a very confusing feature was that despite its original name "*albirostris*" the bill of *intermedius* may be any colour from black to white, coral-red, crimson or yellow-brown.

In the lower Omo River region of southern Ethiopia, both white-billed and red-billed birds are reported to occur together but whether they breed together is not known. A parallel situation also occurs along the South Sudan / northeastern Uganda border where again the two forms overlap, with white-billed birds the more common variety; these come south to Moroto and close to 35°E. Generally, most birds west of 34°E appear to be largely white-billed, while those to the east of that longitude are largely all red-billed. Meanwhile, Granvik (1934) found buffalo weavers common in the acacia country of South Turkana around Lotonok (1°44'N, 35°38'E) in northern Kenya, attributing all to *Bubalornis albirostris intermedius*, at the same time commenting that he never saw a red-billed specimen and that all adult birds had pure black bills with a yellowish-white base.

Recently, Panzera & Boano (2015) gave details of what appeared to be a remark-

able range extension of the White-billed Buffalo Weaver *B. albirostris* to Naabi Hill in northern Tanzania. Photographs clearly showed three male birds with ivory-coloured bills, but also the very plumage characteristics of *B. n. intermedius*, with prominent white margins to the primaries. Naabi Hill lies in the eastern Serengeti at the boundary with the Ngorongoro Conservation Area at 2°55'S, 35°02'E, and only 100 km south of South Nyanza in southwestern Kenya where *intermedius* is resident.

In view of this extraordinary record, it would seem that a full molecular analysis of all *Bubalornis* forms is urgently required. Certainly the original binomial name *Textor intermedius* Cabanis had much to commend it (Archer & Godman *op. cit.*).

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Donald A. Turner

P.O. Box 1651, Naivasha 20117, Kenya

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Tanzania Red-billed Hornbill *Tockus ruahae* feeding on a Giant Water Bug

The Tanzania Red-billed Hornbill *Tockus ruahae* is endemic to Tanzania, where it is widely distributed in central and southern parts of the country. It was described only recently by Kemp & Delport (2002), who suggested it might deserve full species status. Although it was then treated by Kemp (2005) and Dickinson & Remsen (2013) as a subspecies, it is now recognized by some authors as a separate species *T. ruahae* (e.g. by Sinclair & Ryan 2010).

On 20 December 2015 while birding at the Golden Pride Project area, a gold mine located in Nzega District, Tabora Region (33°11'–33°13'E, 4°04'–4°05'S), I saw an individual *T. ruahae* perching on a wire fence (Fig. 1a). It later flew into a shallow seasonal pool of water 8 m away (Fig. 1b) where it caught a Giant Water Bug (Order Hemiptera, Family Belostomatidae) in its beak (Fig. 1c). The bird walked away from the pool, ingested the bug (Fig. 1d) and flew away. Since the habits of *T. ruahae* have not been well documented, it is my hope that this record will add to what is known about its feeding ecology.



Figure 1. Tanzania Red-billed Hornbill *Tockus ruahae*, perching on a fence (a), in a shallow temporary pond (b), with a Giant Water Bug in the pond (c), and with the bug out of water (d).

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Chacha Werema

Department of Zoology and Wildlife Conservation, University of Dar es Salaam. P.O. Box 35064, Dar es Salaam, Tanzania. E-mail: cwerema@yahoo.co.uk

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The breeding of Abyssinian Scimitarbill *Rhinopomastus minor* and Red-throated Tit *Parus fringillinus* in nest boxes in the central Rift Valley of Kenya

The Abyssinian Scimitarbill *Rhinopomastus minor* is an uncommon resident of thorn scrub in low altitude areas, largely below 1400m (Zimmerman *et al* 1996). During June–July 2009, a pair successfully raised three young in a nest box at Green Park Estate, Eburru, near Naivasha (0°40'S 36°12'E, 2150m). However, between October

2009 and July 2012, when the pair laid a total of thirty three eggs (11 clutches of 3 eggs each), their success rate was zero, due to every clutch being targeted by Greater Honeyguides *Indicator indicator*, and on two occasions two honeyguide eggs were found in the nest box used by the scimitarbills. As a result, during this three year period, no scimitarbills hatched, while from twelve honeyguide eggs seven young successfully fledged, though on four occasions all eggs from the nest box were ejected by the scimitarbills so that four of the eleven clutches failed completely. Later, between August 2012 and September 2014, four scimitarbill clutches (12 eggs) were laid without any honeyguide parasitism, and a total of eleven young was successfully fledged.

The Red-throated Tit *Parus fringillinus* is an East African endemic species largely confined to acacia country throughout Masailand in southern Kenya and Tanzania, with little or no breeding data available since that recorded in Brown & Britton (1980). With Britton (1980), Zimmerman *et al* (1996) and Fry & Keith (2000) all giving altitudinal limits of 1000–1600 m, it is worth noting that a pair has bred successfully in nest boxes at Green Park Estate, Eburru, near Naivasha at an altitude of over 2100 m. The area is close to the northernmost limits of the known range, but the site at Green Park has clearly become highly favoured and successful for breeding for this and several other hole nesting bird species (Dangerfield 2011).

Nest boxes were erected in 2009 and one pair of tits bred successfully in four boxes over a six-year period, raising in excess of forty young. Breeding took place at least twice per annum from 2009 to 2013 during the wetter April–July and October–December months, while from August 2014 to January 2016, during a prolonged period of low rainfall, eleven young fledged from a total of six clutches.

Between 2007 and 2012 a pair of White-bellied Tits *Parus albiventris* also utilised four nest boxes and successfully raised a total of nineteen young from ten clutches. This is believed to represent the first record of these two *Parus* species breeding alongside each other.

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Grahame Dangerfield

P.O. Box 1142, Village Market, Nairobi 00621

Donald A. Turner

P.O. Box 1651, Naivasha 20117

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East African Rarities Committee (EARC) Special Report Species included for East African countries in Britton (1980) which have since been considered unacceptable

David Fisher (Chairman), David Pearson and Nigel Hunter (Secretary) on behalf of the EARC

During the late 1980s and early 1990s the EANH S Ornithological Sub-committee (O S-C) re-assessed records of a number of species listed for East African countries in Britton (1980) (hereafter referred to simply as Britton). They were assisted by members of the EARC and other outside experts. Acceptance of several records was deemed unsafe. Some had been included on the basis of bald reports, and attempts to obtain additional details proved unsuccessful. In other cases the original descriptions failed to exclude all likely confusion species.

For Kenya, twelve species from Britton were rejected by Zimmerman *et al.* (1996) where their omission was briefly commented on. For Uganda, seven unacceptable species were discussed by Carswell *et al.* 2005. Three species unacceptable for Tanzania have been discussed in papers in *Scopus* (Baker 1990, 2010, Turner & Baker 2011). But most of these re-assessments have never been formally published in a consolidated list or report, and so some species may still be considered to be authentic. This short report therefore sets the record straight. Nomenclature follows that used in Britton.

Kenya

Following Zimmerman *et al.* (*op. cit.*) records of twelve species should be removed from those included in Britton.

Red-tailed Tropicbird *Phaethon rubricauda* [near Kiunga 1961]

Ruddy Shelduck *Tadorna ferruginea* [Lake Turkana]

Asiatic Dowitcher *Limnodromus semipalmatus* [Lake Nakuru November 1966]

Brown Skua *Catharacta antarctica* [near Kiunga August 1961]

Mediterranean Gull *Larus melanocephalus* [Turkana April 1975 and Lamu August 1978]

Little Gull *Larus minutus* [Turkana January 1978. And see *Scopus* 3: 26]

Black-billed Wood Dove *Turtur abyssinicus* [Lake Turkana and Uganda border at Amudat]

Pale-billed Hornbill *Tockus pallidirostris* [Taveta]

Ashy Starling *Cosmopsarus unicolor* [Lake Jipe]

Blue-throated Brown Sunbird *Nectarinia cyanolaema* [Kakamega]

Chestnut-breasted Negrofinch *Nigrita bicolor* [Kakamega]

Southern Cordon-bleu *Uraeginthus angolensis* [Lake Jipe]

Uganda

Following Carswell *et al.* (*op. cit.*) seven species included for the country by Britton are unacceptable:

Eleonora's Falcon *Falco eleonora* [Kidepo NP March 1972].

Black-faced Sandgrouse *Pterocles decoratus* [Kidepo NP].

Red-fronted Parrot *Poicephalus gulielmi* [Impenetrable Forest].

Blue Cuckoo Shrike *Coracina azurea* [Mafuga Forest].

Grauer's Cuckoo Shrike *Coracina graueri* [Rwenzoris. Listed in Appendix 3 of Carswell *et al.* (*op. cit.*)].

Brown-tailed Rock Chat *Cercomela scotocerca* [Karamoja].

Splendid Sunbird *Nectarinia coccinigaster* [West Nile].

Tanzania

Four species from Britton have been considered untenable. Three of these are discussed by the authority given. The Gadwall record, rejected by the O S-C and implicitly by Zimmerman *et al.* (*op. cit.*) lacked supporting details.

Gadwall *Anas strepera* [Ngorongoro Crater December 1964].

Somali Bee-eater *Merops revoilii* [Dar es Salaam November 1970]. Baker (2010).

Red-tailed Greenbul *Criniger calurus* [Bukoba]. Baker (1990).

Golden Palm Weaver *Ploceus bojeri* [Tanga]. Turner & Baker (2011).

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David Fisher

56 Western Way, Sandy, Bedfordshire, SG19 1DU, United Kingdom

David Pearson

4 Lupin Close, Reydon, Southwold, Suffolk IP18 6NW, United Kingdom

Nigel Hunter

P.O. Box 24803, Karen 00502, Nairobi, Kenya

East African Rarities Committee Report 2013–2015

David Fisher (Chairman) and Nigel Hunter (Secretary) on behalf of the EARC

The East African Rarities Committee assesses records of new and very rare birds occurring in Kenya, Tanzania, Uganda and Rwanda. This includes up to the fifth record of any species from each of the four countries. Sightings of species for which there are fewer than five records for a country should be submitted to the EARC Secretary: Nigel Hunter, P.O. Box 24803, Karen 00502, Nairobi, Kenya. Email: nigelhunter@timbale.org. Please contact the Secretary to obtain clarification of whether a record requires a submission and for guidance on what details to include in the submission. Past records of rare species are also sought in order to bring the EARC database up to date.

Since the Committee's last report in 2014 (*Scopus* 33: 87–91) the following records have been accepted:

Forest Francolin *Peliperdix lathamii*

First record for Tanzania at Minziro Forest on 19 July 1987. Observed regularly on the forest floor and roosting up to 5m above the forest floor at night. Adult and juvenile birds were mist netted and photographed on at least two occasions (Howell 1987). One adult female specimen is currently housed in the AMNH, New York. Previously known only from southern and western Uganda in the Mabira Forest 1913–16, the Bwamba lowlands in 1967, and the Kibale Forest in 1985. Although not racially assigned, the Minziro birds appear to be heavier and longer-winged than typical *schubotzi* in Uganda (N.E. Baker & E.M. Baker *in litt*).

Black-browed Albatross *Thalassarche melanophris*

Second accepted record for Kenya. One observed approximately 2km off Mtwapa, Kilifi District, 31 October 1998 (R. Brennneisen).

Western Reef Heron *Egretta (gularis) schistacea*

First record for Tanzania. One white phase bird photographed feeding alongside two Dimorphic Egrets at Bagamoyo on 04 March 2012 (N. Baker, R. Marais, J. Simms & S. Wells). [Taxonomy of the entire Little Egret complex remains the subject of some debate].

Christmas Island Frigatebird *Fregata andrewsi*

First record for Kenya and the Western Indian Ocean. One, possibly two birds photographed near Malindi December–January 1969–70 (Mann 1986). [Support for this acceptance was received from two independent reviewers familiar with *F. andrewsi*].

Fox Kestrel *Falco alopex*

First record for Tanzania. One photographed on the Osugat Plain, 40km north of Arusha on 8 March 2006 (J. Wolstencroft, A. Harries & F. Christopher).

Red-footed Falcon *Falco vespertinus*

Second record for Uganda. One observed over Lake Saka near Fort Portal on 5 October 2014 (Skeen 2015).

Crested (Oriental) Honey Buzzard *Pernis ptilorhynchus*

First record for Kenya and the East African region, and only the second or third record for sub-Saharan Africa. One, a presumed adult female, was photographed in flight over farmland close to the edge of Meru NP on 26 September 2014 (R. & E. Marsh). [The record was reviewed and accepted by several raptor experts familiar with this species].

Beaudouin's Snake Eagle *Circaetus (g.) beaudouini*

Birds photographed in western Kenya at the Bunyala Rice Scheme (13 April 2013, 20 March 2014) and at Nambale in Busia District (27 March and 22 April 2012) were all accepted as the 2, 3, 4 and 5 records for Kenya. (B. Finch & M. Odino). Elsewhere, one photographed at Lake Mburo NP, southern Uganda on 2 October 2011 further confirmed its widespread distribution there (B. Finch).

Arabian Bustard *Ardeotis arabs*

Fifth record for Kenya. One bird (possibly two) photographed in Sibiloi NP, East Turkana, on 11 February 2015 (W. Wamiti, P. Mikula & M. Hromada).

Grey Phalarope *Phalaropus fulicarius*

First record for Tanzania. One photographed on a shallow and slightly alkaline lake 12km southwest of Naabi Hill, Serengeti NP, on 25 June 2014 (D. Rosengren & M. Palmer).

Cream-coloured Courser *Cursorius c. cursor*

First record for Kenya of the Palaearctic nominate race at Lake Turkana in January and February 1987 (Schekkermann & van Wetten 1988).

Black Tern *Chlidonias niger*

First record for Tanzania. One in breeding plumage among a flock of White-winged Black *Chlidonias leucopterus*, Common *Sterna hirundo* and Saunders's *Sternula saundersi* Terns on Maziwe Island, 45 km south of Tanga, on 20 March 2009 (M. Baker).

Lesser Noddy *Anous tenuirostris*

Photographic evidence from the Rufiji River in the northern Selous GR (17 January 2005) and Maziwe Island and other sandbanks around Tanga (January and March 2013) confirm several earlier reports of periodic influxes of this species to Tanzania waters. In March 2013 over two thousand birds were estimated resting on a sandbank north of Tanga (O. Hamerlynck).

Long-tailed Skua *Stercorarius longicaudus*

First record for Uganda. One observed over Lake Munyamyanze near Katwe, Lake Edward, southwest Uganda on 5 December 2014 (Hayman & Thorns 2015). Elsewhere an adult photographed at Lake Ndutu in the eastern Serengeti NP on 4 May 2007 was accepted as the second record for Tanzania (A. Geertsema).

Arctic Skua *Stercorarius parasiticus*

One photographed near Kisite Island on 24 July 2013 was accepted as the 5 record for Kenya (M. Mwema).

Subantarctic Skua *Catharacta antarctica*

An injured bird found on Fanjove Island (8°34'S, 39°34'E) on 3 September 2013 and successfully released there on 3 October 2013 was accepted as the first record for Tanzania. (P. Ciotti & G. Bordon). [Tarsal measurements clearly ruled out South Polar Skua *C. maccormicki*].

European Turtle Dove *Streptopelia turtur*

A report of one near Naabi Hill, eastern Serengeti NP, on 23 February 1997 (T. Stevenson), and an immature bird photographed near the Mbalageti River in the western Serengeti NP on 9 November 2011 (T. Sinclair) were accepted as the 1 and 2 records for Tanzania.

Bare-faced Go-Away-Bird *Corythaixoides p. personatus*

One near Sololo, west of Moyale on 28 May 1988 was the first confirmed record of the nominate form in Kenya (T. Stevenson). [del Hoyo & Collar 2014 consider this form worthy of full species status with the English name Brown-faced Go-away-bird].

Dusky Long-tailed Cuckoo *Cercococcyx mechowii*

Birds mist netted and photographed at Minziro during the period 21–27 November 1993 and October 1998 were accepted as the 1 and 2 records for Tanzania (Baker & Baker 1994).

Fraser's Eagle Owl *Bubo p. poensis*

One photographed in Semliki NP, western Uganda on 3 January 2015 was only the 5 record for Uganda (R. Skeen).

Akun Eagle Owl *Bubo leucostictus*

First record for Uganda. One photographed in Semliki NP on 27 September 2014 (T. Nyegaard & S. Ampeire).

Fiery-necked Nightjar *Caprimulgus pectoralis nigriscapularis*

A bird calling near Minziro village (1°02'S, 31°32'E) in northwest Tanzania was accepted as the first record of this subspecies for Tanzania (McEnery 2014).

White-bellied Kingfisher *Corythornis leucogaster leopoldi*

First record for Tanzania at Minziro Forest in July 1987. Several birds were mist netted and photographed (Howell 1987).

Southern Carmine Bee-Eater *Merops nubicoides*

While the first documented record for Uganda was at Lake Mburo NP in July 1998 (Carswell *et al.* 2005), photographs from Murchison Falls NP in July 2003, July 2005 and July 2007 were accepted as the 2, 3 and 4 records for Uganda (B. Finch & P. Didicoat).

Shrike Flycatcher *Megabyas flammulatus*

First record for Tanzania at Minziro Forest on 8 July 1987 (D. Moyer & M. Woodcock).

[Willard's Sooty Boubou] *Laniarius sp.*

While birds photographed and tape recorded in the Nyungwe Forest, Rwanda (July

2013), and at Buhoma in the Bwindi-Impenetrable NP, southwest Uganda, in June 2012 and June 2013 were accepted as being what was recently described as *Laniarius willardi* (Voelker *et al.* 2010), the taxonomic status of this form in East Africa remains a subject of debate. It may well belong within the *Laniarius poensis* complex as recently suggested by Dickinson & Christidis (2014), while on the other hand the name *melas* (Reichenow 1908) given to a bird collected in the Nyungwe Forest over a hundred years ago may well be an earlier and correct name (Dickinson & Christidis *op.cit.*).

Dusky Lark *Pinarocorys nigricans*

First record for Uganda at Mweya Safari Lodge, Queen Elizabeth NP, on 14 June 2013 (N. Borrow and others).

Boran Cisticola *Cisticola bodessa*

Second record for Uganda at Kidepo Valley NP on 3 September 2011 (B. Finch).

Tiny Cisticola *Cisticola nanus*

First record for Uganda at Kidepo Valley NP on 4 September 2011 (B. Finch).

Olive-green Camaroptera *Camaroptera chloronota*

First records for Tanzania at Minziro Forest in July 1987. A total of seven birds were mist netted and photographed (Howell 1987).

Yellow-lored Bristlebill *Bleda notatus*

Although the first record for Tanzania was at Minziro on 7 December 1984 (Baker & Hirslund 1987), several others were present there during July 1987 (Howell 1987). [This species was formerly known as the Green-tailed Bristlebill *Bleda eximius*, but following Chappuis & Erard (1993), the yellow-lored, dark-eyed *notatus* is treated as a distinct species from *eximius*. Meanwhile the East African form (*ugandae*) has bright lemon-yellow eyes, and although included within *notatus* by Chappuis & Erard (*op.cit.*), may be worthy of further scrutiny].

Spotted Greenbul *Ixonotus guttatus*

Although the first records for Tanzania were at Minziro in December 1984 (Baker & Hirslund 1987), several small groups were regularly observed there during July 1987, calling from the high canopy of fruiting fig trees (Howell 1987). Tape recording evidence and sketches of the Minziro birds were unanimously accepted as belonging to this distinctive greenbul.

Little Grey Greenbul *Andropadus gracilis*

First record for Tanzania. Specimen collected at Minziro Forest on 26 October 1998 (D. Moyer).

Simple Greenbul *Chlorocichla simplex*

One in the Ishasha area of Queen Elizabeth NP was accepted as the first record away from the Bwamba lowlands (B. Finch).

Icterine Greenbul *Phyllastrephus icterinus*

First records for Tanzania at Minziro Forest in July 1987 and October 1998 (N. Baker, D. Moyer). Additional photographic and audio evidence presented confirmed the presence of this species at Minziro.

Xavier's Greenbul *Phyllastrephus xavieri*

While the first documented record for Tanzania was at Minziro in December 1984 (Baker & Hirslund 1987), several others were recorded there in July 1987 and October 1998. There is also a specimen from Minziro housed in the American Museum of Natural History, New York. Meanwhile audio evidence has also confirmed the presence of this species at Minziro.

Yellow Longbill *Macrosphenus flavicans*

Photographic evidence from Minziro in July 1987 was accepted as the first record for Tanzania.

Grey Longbill *Macrosphenus concolor*

Audio evidence from Minziro Forest in October 1998 was accepted as the first record for Tanzania (D. Moyer).

Scaly-breasted Illadopsis *Illadopsis albipectus*

While the first documented record for Tanzania was at Minziro on 7 December 1984 (Baker & Hirslund 1987), several others were mist netted and photographed there during July 1987 (Howell 1987).

White-tailed Ant Thrush *Neocossyphus poensis*

Photographic evidence of mist netted birds from Minziro in July 1987 was accepted as the first records for Tanzania.

Fire-crested Alethe *Alethe diademata*

While the first documented record for Tanzania was at Minziro in December 1984 (Baker & Hirslund 1987), several others were mist netted and photographed there during July 1987 (Howell 1987).

Blue-shouldered Robin Chat *Cossypha cyanocamptor*

Photographic evidence of mist netted birds from Minziro in July 1987 was accepted as the first records for Tanzania.

Forest Robin *Stiphrornis erythrothorax*

Photographic evidence of mist netted birds from Minziro in July 1987 was accepted as the first records for Tanzania.

Lowland Akalat *Sheppardia cyornithopsis*

While the first documented record for Tanzania was at Minziro in December 1984 (Baker & Hirslund 1987), several others were also mist netted and photographed there during July 1987 (Howell 1987).

Ruaha Chat *Myrmecocichla (arnotti) collaris*

A report from Rubanda, Kabale District, sw Uganda on 13 June 2012 was accepted as the recently described Ruaha Chat (N. Borrow and others). This bird was previously known in Uganda as the White-headed Black Chat, resident and breeding around Murema Hill along the Rwanda border in Kagera District (vande Weghe 1992, Carswell *et al.* 2005).

Grey-throated Flycatcher *Myioparus griseigularis*

Photographic evidence of a mist netted bird at Minziro on 20 July 1987 was accepted

as the first record for Tanzania. [Britton (1980) had earlier reported a historical record from the Bukoba region, details of which cannot be traced].

Collared Flycatcher *Ficedula albicollis*

Single birds photographed at Lake Mutande, Kisoro District, on 24 March 2014, and at Lake Bunyampaka, Kasese District, on 8 March 2015 were accepted as the 2 and 3 records for Uganda (F. Hodgson, P. L'Hoir & J. Heggen).

White-billed Buffalo Weaver *Bubalornis albirostris*

Three male birds photographed at the Naabi Hill Gate, Serengeti NP, in March and May 2005 and November 2013 were accepted as this species (Panzera & Boano 2015).

Northern Masked Weaver *Ploceus taeniopterus*

Photographic evidence of two birds in a mixed weaver colony near Fort Portal in early October 2014 was accepted as the first record for Uganda (R. Skeen).

White-collared Olive-back *Nesocharis ansorgei*

While the first documented record for Tanzania was at Minziro in December 1984 (Baker & Hirslund 1987), photographic evidence of birds mist netted at Minziro in July 1987 was accepted as further evidence of its presence at Minziro.

Jameson's Antpecker *Parmoptila jamesoni*

First record for Tanzania at Minziro Forest in July 1987. A field painting by Martin Woodcock of a mist netted bird was accepted as the first record for Tanzania. This scarce and little known species was previously known only from specimens and a few recent sight records in the Bwamba lowlands and the Kalinzu and Bwindi-Impenetrable forests of western Uganda. [Formerly known as *P. woodhousei jamesoni*, but considered worthy of specific status by Chapin (1954) despite similar females, but with no known intergrades in an area of overlap. See also Woodcock (2003).

Orange-cheeked Waxbill *Estrilda melpoda*

A report of several birds observed feeding with Bronze Mannikins *Lonchura cucullata* in the Semliki Valley on 15 September 2013 was accepted as further evidence of its continued presence in that area of western Uganda (B. Finch). This species was first recorded from Semliki in December 2002 and June 2003, with regular reports from 2005 onwards (Skeen 2014).

[Western Citril] *Crithagra (citrinelloides) frontalis*

Photographic evidence from the Gwasssi Hills, Homa Bay District, in November 2014 was accepted as the first record of the form *frontalis* for Kenya (Bradley *et al.* 2015). [The systematics of the East African citrils remains a subject of debate. While *frontalis* and *hyposticta* have been considered to comprise two additional species (Fry & Keith 2004, Dickinson & Christidis 2014), their ranges are almost contiguous, and while plumage variation is well marked, vocal differences are evident only in the songs of nominate and *frontalis*. While *brittoni* and *kikuyuensis* may overlap in a small area of western Kenya, in South Elgon and the Cheranganis there have been several reports dating back to Van Someren's days of intergrades between *frontalis*, *kikuyuensis* and possibly *brittoni*. Certainly all three come closest to each other in the area astride the Kenya / Uganda border, and high up on Elgon (close to the tree line) there are some black-faced (*frontalis*-type) birds as well as grey-faced forms].

Papyrus Canary *Crithagra koliensis*

The report of two birds mist netted and photographed at the edge of a papyrus swamp in the Kagera River Valley close to the Rwandan border on 1 December 1993 was accepted as the 1 record for Tanzania (Baker & Baker 1994).

Brown-rumped Bunting *Emberiza affinis*

One observed on the Kongelai Escarpment, Kapenguria, on 21 March 2012 was accepted as the 3 record for Kenya (N. Hunter & M. Sinyereri).

The following records were REJECTED, either due to misidentification or insufficient details to establish identification with certainty:

Long-legged Buzzard *Buteo rufinus* at Akagera NP, Rwanda, on 30 September 2011; Lesser Sandplover *Charadrius mongolus* at Lake Albert, Uganda, in early March 2014; Pomarine Skua *Stercorarius pomarinus* near Tanga, Tanzania, on 4 January 2015; Rufous-cheeked Nightjar *Caprimulgus rufigena* southwest of Songea, southern Tanzania, in May and July 1994; Wood Warbler *Phylloscopus sibilatrix* at Chumbe Island off Zanzibar on 21 March 1995; Northern Masked Weaver *Ploceus taeniopterus* at Murchison Falls NP, Uganda, on 30 December 2013; and Tawny Pipit *Anthus campestris* at Mafia Island, Tanzania, on 28 January 1997.

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David Fisher

56 Western Way, Sandy, Bedfordshire, SG19 1DU, United Kingdom

Nigel Hunter

P.O. Box 24803, Karen 00502, Nairobi, Kenya

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